ADDITIONAL DATA INDEX

3.3.1. Number of research paper published per teacher in the Journals notified on UGC care list during last five years

3.3.1.1. Number of research papers in the journals notified on UGC CARE year wise during last five years.

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2	Jan-Dec 2020	13	24-36
3	Jan-Dec 2019	08	37-44
4	Jan-Dec 2018	05	45-49
5	Jan-Dec 2017	07	50-56

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Review Article

SODIUM-GLUCOSE LINKED COTRANSPORTER 2 INHIBITOR: A NEW HORIZON IN THE TREATMENT OF TYPE-2 DIABETES

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Received: 10 October 2020, Revised and Accepted: 19 January 2021

ABSTRACT

Hyperglycemia is a key therapeutic focus in the management of patients with type 2 diabetes (T2D) mellitus. The various therapeutic classes of antidiabetic drugs presently existing in the market are not sufficiently effective in maintaining long-term glycemic control in most of the diabetic patients, even when used in combination. The undesirable adverse effects of these drugs, such as hypoglycemia, weight gain, and hepatic and renal toxicity, have escalated the demand for the discovery of new and safer antidiabetic drugs. The progressive nature of T2D requires practitioners to periodically evaluate patients and intensify glucose-lowering treatment once glycemic targets are not attained. Sodium-glucose cotransporter 2 inhibitors (SGLT2-is) are the new class of antidiabetic medications that are approved (2013) by the Food and Drug Administration recently for treating diabetes. These inhibitors block the SGLT2 protein involved in glucose reabsorption from the proximal renal tubule resulting in escalated glucose excretion and lower blood glucose levels. These inhibitors exhibit favorable effects beyond glucose control, such as consistent body weight, blood pressure, and serum uric acid reductions. This review highlighted the brief updates of SGLT2-i, their benefits, and adverse effects.

Keywords: Type-2 diabetes mellitus, Sodium-glucose linked cotransporter 2, Sodium-glucose linked cotransporter 2 inhibitors, Gliflozins, Antidiabetic drugs.

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INTRODUCTION

Diabetes is a complex and chronic disease that affected an estimated 29.1 million Americans in 2012 [1]. As per the statistical data of the International Diabetes Federation, diabetes mellitus (DM) patients were 415 million. By 2040, the projected number of patients will be about 642 million [2]. Billions of dollars are spent each year around the world in health disbursement related to diabetes [3]. Increasing insulin resistance, escalating the deterioration of β-cell function, dysfunctional adipocytes, gastrointestinal incretin defects, and increased glucose reabsorption from the kidneys, hyperglucagonemia, and neurotransmitter dysfunction may give rise to the progression of diabetes [4,5]. Progressive nature of type 2 diabetes (T2D) typically requiring multiple medications to control blood glucose levels and periodical evaluation of patients and intensify glucose-lowering treatment once the glycemic target is not attained [6]. Although hyperglycemia is a lead therapeutic focus in the management of T2DM, many patients experience suboptimal glycemic control [7].

Due to the intricacies of diabetes and the maintenance of the compliance of patients with diabetes [8], various oral antidiabetic drugs (OADs) approved in DM combined with insulin such as metformin, sulfonylureas, a-glucosidase inhibitor, dipeptidyl peptidase-4 inhibitors (DDP-4 inhibitors), glucagon-like peptide-1 receptor agonist, and thiazolidinedione [9]. Nevertheless, some undesirable adverse effects caused by administrating these medications, including hypoglycemia, weight gain, gastrointestinal symptoms, and hepatic and renal toxicity, have escalated demand for the discovery of safer antidiabetic agents with new therapeutic mechanisms [8].

In normoglycemic people, approximately 180 g of glucose is filtered daily by renal glomeruli and is then reabsorbed in the proximal convoluted tubule (PCT). This is attained by passive transporters, namely facilitated glucose transporters (GLUTs) and active cotransporters, namely, sodium-glucose cotransporters (SGLTs) [10]. Increased blood glucose level stimulates proximal tubular growth and SGLT2 expression, thus increases renal glucose reabsorption and an unsatisfactory control of diabetes. Inhibition of SGLT2 stimulates glucosuria and reduces blood glucose levels [8].

Recently, the US Food and Drug Administration (FDA) has introduced SGLT-2 inhibitors (SGLT2-is), a novel class of glucose-lowering compounds known as the gliflozins for treating T2DM. SGLT2-is including dapagliflozin, empagliflozin, canagliflozin, ertugliflozin, and tofogliflozin have only been applied in T2DM [9-11-14].

Phlorizin (non-specific SGLT2-i) [15] was the first SGLT2-i discovered over 100 years ago. It is a flavonoid found in the root bark, leaves, shoots, and fruit of the apple tree [11,16]. In the proximal tubule, the two main active GLUT systems were characterized as the SGLT1 (high affinity, low capacity) and SGLT2 (low affinity, high capacity) [8]. SGLT1 is expressed mainly in the small intestine, proximal tubule of nephrons, and the myocardium and is responsible for glucose reabsorption [16,17]. SGLT1-i by phlorizin can lead to extrarenal side effects such as diarrhea and nausea [18]. Besides poor solubility of phlorizin in water and its poor oral bioavailability [19], it was not an ideal therapeutic candidate to treat diabetes [11]. To avoid SGLT1-dependent side effects, phlorizin derivatives have been developed that are more specific inhibitors of SGLT2 [16].

SGLT2, the most prevalent and important SGLT subtype, accounts for more than 90% of glucose reabsorption in the early proximal tubule and optimally maintains blood glucose levels [8,20,21]. As a key mechanism for glucose homeostasis in a kidney, therefore, SGLT2-is are considered promising agents for treating T2D as SGLT2-is that target the kidney, reduce renal glucose reabsorption, and increase urinary glucose elimination, thus lowering glucose blood levels [7,22-24]. SGLT2-is achieve a reduction in glycated hemoglobin (HbA1c) of 4.4–12.1 mmol/mol (0.4–1.1%), depending on the baseline HbA1c and the specific drug and dose used [22].

Two SGLT2-is have been evaluated in major clinical trials in individuals with T2D: Empagliflozin in the EMPA-REG OUTCOME trial and canagliflozin in the Canagliflozin Cardiovascular Assessment Study

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Review RRJoI

COVID-19: An Emerging Global Threat

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Abstract

The emergence of COVID-19 in Wuhan, Hubei Province, China in December 2019 has worsened global health worries. It is now declared by World Health Organization (WHO) as a Public Health Emergency of International Concern (PHEIC). Till 22 March 2021, there have been 122,524,424 confirmed cases of COVID-19 globally, with 2,703,620 deaths, and more than 216 countries are suffering from this fatal virus. The transmission of coronavirus occurs via droplets, filthy hands, and surfaces with an incubation period of 2 to14 days. The speed of the transmission of this lethal infection airs a severe danger to public health. To alleviate COVID-19 patients, it is imperative, to begin with, the initial diagnosis, isolation, and supportive management. As a part of the massive worldwide response to limit and contain the pandemic, an important consideration was placed on producing research intelligence to monitor evidence-based responses to confine the SARS-CoV-2 virus. Currently, the novel variants of the COVID-19 have been detected in the UK, South Africa, and Brazil. These variants represented several mutations on spike proteins. A potential escalation in the transmission of SARS-CoV-2 infection in humans due variants development has raised a serious concern. The present review highlights the general characteristics of SARS-CoV-2, pathogenesis, transmission, diagnosis, epidemiology, and treatment of COVID-19 infection. It also focuses on the current information on new variants of coronavirus-19, emergency use authorization of COVID-19 vaccine, and regulatory requirement for developing and introducingCOVID-19 vaccines in the Indian market.

Keywords: COVID-19, SARS-CoV-2, β-coronavirus, Public Health Emergency of International Concern, Pandemic, COVID-19 vaccine

INTRODUCTION

A novel β-coronavirus appeared in Wuhan, Hubei Province, China, at the end of December 2019 and initiated an extremely communicable and pathogenic viral respiratory tract infection entitled as 'COVID-19' (also named as 2019-nCoV) [1-4]. COVID-19 was linked with a bunch of respiratory tract infections and has promptly spread across continents [2]. Despite drastic repression actions, the spread of this virus has turn out to be a worldwide menace [5]. Phylogenetic data indicate a zoonotic origin, and the quick spread involves the ongoing transmission from one person to another [6]. It ranks ahead of SARS-CoV (severe acute respiratory syndrome coronavirus) and MERS-CoV (Middle East respiratory syndrome coronavirus) in terms of pathogenicity in human beings [7, 8]. Hence, WHO declared COVID-19 declared as the Public Health Emergency of International Concern (PHEIC) on 31st January 2020 [7].

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STRUCTURAL CHARACTERISTICS OF SARS-COV2

Coronaviruses belong to the family, Coronaviridae, order Nidovirales and subfamily Orthocoronavirinae,

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Formulation Design and Evaluation of Mucoadhesive Buccal Patch of Ketorolac for the Treatment of Periodontitis

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Indore Institute of Pharmacy, Indore

Abstract:- In the present work the aim is to successfully develop a formulation in the form of buccal patch which has prolong residence time also for addressing the problem of osteoporosis in infected teeth. Patients can control the period of administration or terminate delivery in case of emergencies. The buccal drug delivery systems easily administered into the buccal cavity. The novel buccal dosage forms Exhibits better patient compliance. The formulation F4 is selected for best formulation because its show the 98.85% drug release at time 6 hr, folding endurance is 189±4 times and weight of prepared film is 95±4 mg and thickness 43±2 mm of these formulations respectively.

Keywords: *Ketorolac, Mucoadhesive, Formulation and Evaluation of Buccal Film, Solvent Casting, Buccal Film.*

I. INTRODUCTION

Buccal patches are preferable in terms of flexibility and comfort. The application of buccal patches to the site is easy and can be removed according to our need (Raghavendra, 2013). Buccal patch consists of mucoadhesive polymers and other excipients. Due to the adhesive property of the polymer it will binds to the buccal mucosa and the drug will be released to the systemic circulation (Khobragade, 2014).

II. EXPERIMENTAL SECTION

Materials:

Ketorolac tromethamine were obtained as a gift sample from Bioplus life science, Bangalore, HPMC-E15 was purchased from lobachemie,Mumbai,PEG-400,Edudragit RLPO,RSPO and carbopol 934P was purchased from Lobachemie,mumbai, ethanol was purchased from Qualigens fine chemicals, Mumbai.

Method:

Solvent casting:-In the solvent casting process, a specified amount of mucoadhesive polymers is treated with solvent, and the polymer swells after vortexing. The determined amount of plasticizer was applied to the polymer mixture and vortexed again. The necessary amount of medication was liquefied in a small amount of solvent method and then applied to the polymer solution and thoroughly mixed. The entrapped air is then released, and the mixture is transferred to a freshly cleaned Petri plate. The patches are held in a desiccator until the assessment checks are completed (Tarun et al,2013).

Formulation and evaluation of mucoadhesive buccal patches

Ketorolac tromethamine buccal patches are prepared by solvent casting technique using aluminium foil (placed as substrate on glass mold (5*15cm). The composition of multiple formulations of a single square cast patches is stated in the table 1. Ethanol was used as a solvent and PEG as a plasticizer in conjunction with Edudragit RLPO, Eudragit RSPO and Carbopol 934P, and buccal patches were prepared using HPMC-E15(Semalty,2008).

Table 1: Formulation Ingredient for the preparation of mucoadhesive buccal patches

Components	F1	F2	F3	F4	F5	F6
Ketorolac tromethamine (mg)	120	120	120	120	120	120
HPMC-E15 (mg)	1000	1000	1000	1000	1000	1000
Edudragit RLPO (mg)	300	-	-	150	-	100
Eudragit RSPO (mg)	-	300	-	150	150	100
Carbopol 934P (mg)	-	-	300	-	150	100
PEG (ml)	0.5	0.5	0.5	0.5	0.5	0.5
Ethanol (ml)	20	20	20	20	20	20

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INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Formulation Design and Evaluation of 3D Printed Tablet of Cinnarizine by Fused Deposition Modeling Technique

SUDHANSHU SINGH*, KULDEEP VINCHURKAR, PANKAJ DIXIT, DINESH K. MISHRA

Indore Institute of Pharmacy, Indore (Rajiv Gandhi Proudyogiki Vishwavidylaya, Bhopal)

Abstract

This study aimed to explore the feasibility of fused deposition modeling (FDM) 3D printing to prepare tablets of cinnarizine. Cinnarizine is an antihistamine drug, was chosen as a model drug to investigate, and was successfully loaded into commercial polyvinyl alcohol (PVA). The tablet was designed by AutoCAD then designed tablet was sliced by the Cura Ultimaker 4.4 software. The filaments were then printed into hollow structured tablets with 0% infill than Cinnarizine drug was added on the hollow tablet and closed the upper surface with help of a 3D printer. The drug-loaded 3D printed tablet was evaluated for drug release under in-vitro dissolution conditions, and we found the release profile fit Korsmeyer–Peppas release kinetics.

Keyword: 3D Printer, Fused dipostion modeling, 3D Printed Tablet.

Introduction

Three-dimensional (3D) printing is a process of creating 3D objects, where materials are deposited layer over layer using a computer-driven process based on a digital model. In the pharmaceutical field, it has the potential to arriving individualized and on-demand medications to avoid variable effects and adverse reactions during drug therapy. It also provides hopes for formulating patient-centric fixed-dose combinations to reduce multiple daily dosing and thus improve patient compliance. Various techniques for 3D printing, such as fused deposition modeling (FDM), binder deposition, inkjet printing, material jetting, powder bed fusion, photopolymerization, pen-based 3D printing and molding, have been reported in the literature [1,2,3].

Review article
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Features & Facts of Gastroretentive Drug Delivery System – A Review

Gastroretentive İlaç Dağıtım Sisteminin Özellikleri ve Gerçekleri - Bir İnceleme

Short title: Gastroretentive Drug Delivery System

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ABSTRACT
English Oral delivery of drug was the commonly used modality on account of patient compliance and ease of administration. After oral administration of any drug, its bioavailability is affected by the residence time in stomach. Recently, gastroretentive drug delivery systems (GRDDS) are gaining wide acceptance for drugs with a narrow absorption window, decreased stability at high alkaline pH, and increased solubility at low pH. This approach aims to develop a drug delivery system which gets retained within a gastric fluid, thereby releasing its active principles in the stomach. Some of the methods used to achieve gastric retention of drugs include the use of effervescence agents, mucoadhesive polymers, magnetic material, bouncy enhancing excipient, and techniques that form plug-like devices which resisted gastric emptying. This review attempts to provide a concise account of various attributes of recently developed approaches for GRDDS.
Keywords: Bioavailability, bio/mucoadhesive system, therapeutic window, gastric emptying.

ÖZ
İlacın oral doğumu, hasta uyumu ve uygulama kolaylığı nedeniyle yaygın olarak kullanılan modalite idi.Herhangi bir ilacın oral olarak verilmesinden sonra, biyoyararlanı midedeki oturma süresinden etkilenir.Son zamanlarda, gastroretentive ilaç dağıtım sistemleri (GRDDS) dar bir emilim penceresine sahip ilaçlar için geniş bir kabul görüyor, yüksek alkali pH'da stabilite azaldı ve düşük pH'da çözünürlük arttı.Bu yaklaşım, mide sıvısı içinde tutulan ve böylece midedeki aktif prensiplerini serbest bırakan bir ilaç dağıtım sistemi geliştirmeyi amaçlamaktadır.İlaçların gastrik tutulmasını sağlamak için kullanılan yöntemlerden bazıları arasında efervesan ajanların, mukoza yapıştırıcı polimerlerin, manyetik malzemenin, zıplayan arttırıcı ekscipient ve mide boşalmaya karşı dayanıklı fiş benzeri cihazlar oluşturan

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Research Article

Formulation Design and Evaluation of Granisetron Loaded Orodispersible Film for the Treatment of Nausea and Vomiting

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Abstract: Orodispersible film, a new drug delivery system for the oral delivery of the drugs, was developed based on the technology of the transdermal patch. Current developments in the technology have presented viable dosage alternatives from oral route for paediatrics, geriatric, bedridden, nauseous or noncompliant patients. Granisetron hydrochloride a novel serotonin 5-Hydroxytryptamine receptor antagonist used as an antiemetic to treat nausea and vomiting following chemotherapy. It is well absorbed from the gastrointestinal tract, but its oral bioavailability is low (60%) due to extensive first-pass metabolism which makes it an ideal candidate for rapid release drug delivery system. Hence, an attempt was made to prepare and evaluate orodispersible films containing Granisetron hydrochloride as a model drug by solvent casting method using pullulan natural polymer. The various formulations were prepared on the basis of concentration changes of polymer and plasticizer. The prepared orodispersible films were evaluated for their physicochemical and mechanical parameters. In vitro release rate of Granisetron HCl was studied in phosphate buffer pH 6.8. F4 Showed maximum release rate 96.8% in 120 seconds respectively. The selected fast dissolving oral films were found to be superior to marketed conventional tablet. Short-term stability studies of selected films indicated that there is no significant change with respect to physical appearance, disintegration time, drug content and in-vitro drug release. Complete and faster release was observed within 120 Sec when compared to other formulations.

Keywords: Orodispersible Film, Granisetron Hydrochloride, Pullulan Natural Polymer, Solvent Casting Method.

INTRODUCTION

Orodispersible film drug delivery systems (ODFs) were first developed in the late 1970s as based on the technology of the transdermal patch. An alternative to tablets, capsules, and syrups for paediatric and geriatric patients who experienced difficulties in swallowing traditional oral solid dosage forms (Nagar, P. *et al.*, 2011).

ODFs:

A solid dosage form that dissolves or disintegrates quickly in the oral cavity, resulting in solution or suspension without need for the administration of water, is known as oral fast dispersing dosage form.

These are also called as, orally dissolving films, flash release wafer, wafer, quick dissolving film, soluble or buccal film- preferred by FDA and European medicines agency using orodispersible films.

Significance of ODFs:

ODFs have attained remarkable significance in pharmaceutical industry for the reason of possessing unique properties and fast dissolution time ranging from seconds to one minute. ODFs design permits to integrate a variety of drugs for their response effects e.g. antitussive, anti-epileptic, anti-asthmatic, expectorant, etc. High temperature and moisture sensitivity necessitate expensive covering and inability of high dose loading is some disadvantages of ODFs (Siddiqui, M.N. *et al.*, 2011; & Aggarwal, J. *et al.*, 2015).

The rationale of the proposed research work, the present investigation was to develop and formulate natural, non-biodegradable, Pullulan based fast dissolving orodispersible films prepared by solvent casting method for indirect absorption of drug via transmucosal lining to the systemic circulation. The present formulation has to improve patient compliance and presents multiple competitive advantages over its marketed oral dosage forms used chemotherapy induced nausea and vomiting patients.

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Formulation and Evaluation of Solid Dispersion Incorporated Fast Disintegrating Tablet Of Antiemetic Drug

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Abstract

In the present work, the aim is to successfully formulate solid dispersion and incorporated it into a fast disintegrating tablet of aprepitant. Firstly increases the solubility of poorly water-soluble aprepitant by solid dispersion and then it is formulated into FDTs with improved patient compliance and convenience. Solid dispersions are prepared by the fusion method and solvent evaporation method. The formulation F9 is selected for best formulation because it shows the % yield 95%, drug content, dissolution 94%. after then selected batch F9 is formulated into FDTs results are disintegration time 12 seconds, dissolution drug release 99 % of this formulation respectively.

Keywords: Solubility, Solid dispersion, Fast disintegrating tablet, Aprepitant.

INTRODUCTION

Nausea is an unpleasant sensory and emotional experience accompanied by an autonomic driven physiological change of pallor and upper GI track hypersecretion [1]. A current oral formulation of aprepitant is indicated for the administration of multiple doses, which was due to the half-life of approximately 9-13 h with a time to peak plasmas level of 4 h [2].

Approximately 40% of patients who receive chemotherapy have experienced nausea and vomiting [3, 4]. Control of nausea and vomiting following chemotherapy and surgery has been improved in recent years due to the advancement of novel, effective, and better-tolerated antiemetic therapies [5-7].

Research Article

Formulation and evaluation of liposomal loaded nail lacquer containing luliconazole an antifungal drug

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Received: 2 May 2021 Revised:13 June 2021 Accepted: 30 June 2021

Abstract

Objective: The aim of present research work was to develop and evaluate the antifungal drug loaded liposomal nail lacquer. Antifungal nail lacquer which is used in treatment of Onychomycosis nail fungal disorder, Onychomycosis is common fungal nail infection causes by the pathogens. The objective of the this formulation to enhanced permeation of luliconazole across the nail plate, delivered via liposome-dispersed nail lacquer, can be attributed to intact permeation of lipid vesicles across the nail plate due to it's a small vesicular size and also to the generated hydration force and osmotic gradient. **Material and Methods:** Initially liposomal suspension (LF) was prepared by Phosphatidylcholine, Cholesterol and luliconazole were dissolved in chloroform/methanol (2:1, v/v) mixture and formulated by modified film hydration technique. Then optimized formulation of liposomal suspension was further used to prepare nail formulation. **Results and Conclusion:** Among different formulations, the formulation (LF-8) was showed good drug entrapment - 69.61±1.09, average particle - 5.36±0.12 and zeta potential - 54.91±3.57. The optimized formulation of liposomal suspension LF-8 was further used to prepare nail formulation. The luliconazole loaded nail lacquer formulation (LLNLF-4) was showed highest *In-vitro* Drug Release (97.38±3.64), antifungal activity and smoothness among the other formulations. Nail lacquer is mostly applicable for those drugs which have poor bioavailability in oral formulation. This technique is used to maximize the topical bioavailability of drug across the nail.

Keywords: Nail lacquer, Luliconazole, Dimethyl Sulphoxide, Phosphatidylcholine, Isopropyl Alcohol

Introduction

Topical treatment of skin and nail diseases is desirable in terms of patient acceptability and reduction of side effects associated with systemic drug delivery. This is particularly the case for nail diseases as they are frequently difficult to cure and also require long periods of treatment (Kassan et al., 1996). The nail plate is a highly keratinized tissue, which is characterized by low permeability to diffusing substance. The nail diseases are widely spread in the population, particularly among elderly and immune- compromised patients (Mohorcic et al., 2007). Current research on nail permeation focuses on altering the, nail plate barrier by means of chemical treatments and penetration

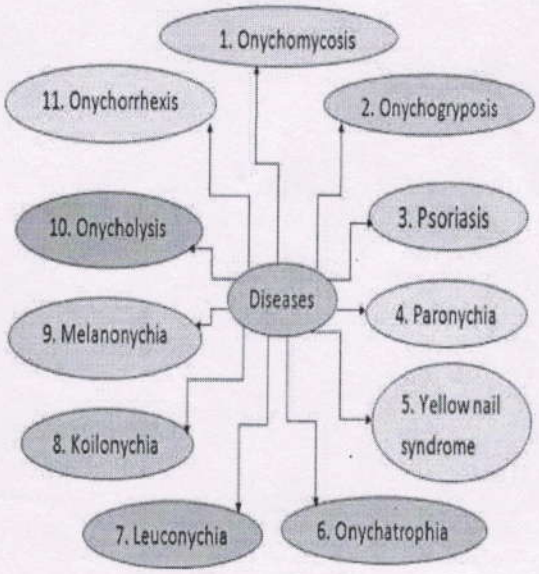

Figure 1. Diseases Affecting the Nail

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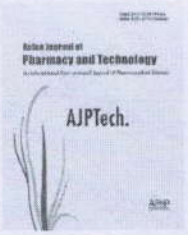

RESEARCH ARTICLE

Formulation, Optimitziation and Evaluation of Polyherbal Anti-Dandruff Shampoo

Arpit Gawshinde*, Dinesh kumar Mishra, Neha Kamalpuria, Nadeem Farooqui, Surbhi Choursiya
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ABSTRACT:
Psidium Guajava, family Myrtaceae and *Glycyrrhiza glabra* family Leguminosae has been reported to possess antioxidant, antimicrobial, antiinflammatory, antibacterial and antifungal properties. Gauva and Liquiorice extracts have been used to treat antimicrobial infections. It contain several chemicals compound such as flavonoids, tannins, phenols, triterpenes, saponins, to take the benefit of the nature of extract. Psidium Guajava and *Glycyrrhiza glabra* prepare shampoo incorporating in the herbal constituent base and evaluate this natural herbal shampoo. The herbal shampoo formulations comprising of hydroalcoholic extract of Psidium Guajava and *Glycyrrhiza glabra* (ethanol:water 80:20v/v), coconut oil, castor oil, cymbopogon citrates oil were prepared and evaluated for physicochemical parameters such as visual appearance, pH, viscosity, % of solids content, foaming capacity and the results showed that the formulation F4 of anti-dandruff herbal shampoo contains all good characters of an ideal shampoo and it was found to be harmless, more effective, ease of manufacturing and economical compared to synthetic antidandruff shampoo.

KEYWORDS: Dandruff, Herbal anti-dandruff shampoo, Lemon grass oil, Liquorices and Guava leaf.

INTRODUCTION:
Dandruff is a chronic scalp condition, which involves excessive shedding of dead skin cells from the scalp. It is caused by a fungus called Malassezia Restricta and Malassezia Globosa. Malassezia formerly called Pityrosporum is a yeast causing infection of skin and scalp. Dandruff is caused due to excessive shedding of dead skin cells from the scalp. It affects 5% of the population and mostly occurs after puberty, between 20 to 30 years, and dandruff affects males more than females. The skin of scalp renews itself about once a month. Usually, scalp sheds dead cells in nearly invisible way, but sometimes cell turnover becomes unusually rapid and dead cells are shed as visible flakes called dandruff. Warm and humid atmosphere, overcrowding, and poor personal hygiene promote the growth of Malassezia.[1,2]

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Anti-dandruff shampoo is a type of shampoo which contains anti-dandruff agent and it is mainly used to prevent or treat dandruff from the scalp of hair. Two types of anti-dandruff shampoos are commercially available.

A. Synthetic anti-dandruff shampoo
B. Herbal anti-dandruff shampoo

Herbal anti-dandruff shampoos:
Herbal anti-dandruff shampoos are the cosmetic formulations which contain herbal ingredients such as plant extracts and essential oil. These herbal shampoos are generally used to remove the dandruff, to add natural color to the hair, to remove the extra oil content of the hair, for the healthy growth of the hair, to remove the dust and scales of the scalp, to prevent hair falling, to impart softness and smoothness to the hair shaft, etc. They can penetrate to the root shafts, stimulate the sebaceous glands, enhance the blood circulation and impart greater strength to the hair root and the shaft. They are also used against alopecia, thinning, clubbing

A Review on "Natural Antioxidant, Source and its Application"

Udit Sharma, Sunil Solanki, Kuldeep Vinchurkar, Pritesh Paliwal, Nadeem Farooqui

Indore Institute of Pharmacy, Indore

Eating food high in antioxidants is highly recommended for a healthy diet. Pure maple syrup features 65 different antioxidants, positioning it among fruits and vegetables well-known for their health benefits. Pure maple syrup is superior to white sugar when it comes to increasing your antioxidant intake. Maple syrup is unprocessed and thus retains all the antioxidant molecules that the tree produces to protect itself in its wild environment. Pure maple syrup contains many active antioxidant elements, such as polyphenols, trace elements and vitamins. Recent studies have shown that maple syrup contains several families of antioxidants, similar to those in berries, tea, whole wheat, flax seed and red wine. The sheer number and variety of healthful compounds in maple syrup makes it a powerful antioxidant cocktail, on par with red Gala apples, broccoli or bananas. 83 gm of maple syrup contains as many antioxidants as an apple, and provides between 10% to 38% of the recommended daily antioxidant allowance.

Introduction

Antioxidant:

Pollutants, ionizing radiation or UV light, smoking, exposure of biological systems to xenobiotics, and development of certain pathological conditions lead to oxidative stress, thereby increases production of oxy radicals. Cell damage caused by free radicals appears to be a major contributor in aging and degenerative diseases such as cancer, cardiovascular disease, cataracts, rheumatoid arthritis, and brain dysfunction. Free radicals have been implicated in the pathogenesis of at least 50 diseases. Fortunately, free radical formation is controlled naturally by various beneficial compounds and antioxidants, and its availability is limited that this damage can become cumulative and debilitating.

Natural antioxidants either are synthesized in human body through metabolic process or are supplemented from other natural sources, and their activity very much depends upon their physical and chemical properties and mechanism of action. This can be further divided into two categories, i.e., enzymatic antioxidants and nonenzymatic antioxidants.

Functions:

Pure maple syrup contains many active antioxidant elements, such as polyphenols, trace elements and vitamins .Recent studies have shown that maple syrup contains several families of antioxidants, similar to those in berries, tea, whole wheat, flax seed and red wine .The sheer number and variety of healthful compounds in maple syrup makes it a powerful antioxidant cocktail, on par with red Gala apples, broccoli or bananas. 83 gm of

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Artificial Intelligence in Pharmacy for Enhancement of Pharmaceutical Industry: A Review

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Date of Submission: 25-12-2020 Date of Acceptance: 12-01-2021

ABSTRACT: Artificial intelligence in pharma refers to using automated algorithms to carry out obligations which historically depend on human intelligence. Above the last five years, the use of artificial intelligence in the pharma and biotech industry has redefined how scientists develop new drugs, tackle disease, and many more. Given the growing importance of artificial intelligence for the pharma industry, AI has the potential to market innovation, whereas at a similar time increasing productivity and providing higher results. Additionally, computing develops the worth proposition of pharmaceutical firms by making new and latest business models. You can observe AI implementation in nearly each side of the pharmaceutical field, from drug innovation and development to drug producing, provide chain and promoting. By implementing and investing AI systems within the progress, pharmaceutical company firms will perform all business operations cost-effectively, expeditiously, and hassle- free .This article is describes the discovery of drug ,tools of AI, producing execution systems automatic management processes systems ,AI has ability predict new treatment ,development of novel peptides from natural material , treatment and management of rare diseases, drug adherence and indefinite quantity ,challenges to adoption of AI in pharmaceutical industry .[1]

KEYWORDS: Artificialintelligence,comprehensive, algorithms, pharma industry, innovation, cost-effectively, implementing.

I. INTRODUCTION

Artificial intelligence may be applied to nearly each component of the pharmaceutical and healthcare industry to enhance information processing. Adopting the generation will display the incredible ability of the healthcare industry with achievement rates flying higher than ever earlier before – specifically within the studies and improvement of important, lifestyles-changing drugs. Ai works as a machine learning system continuously responding and studying information, which permits researchers to gather records effectively. The more data the greater information Ai responds too, the smarter it turns into, continuously advancing the pharmaceutical industry. Not only can Ai benefit treatment of sufferer and provide care solutions, it may optimize the industry. This article will talk how Ai can be used to improve pharmaceutical and how it is able to increase itself inside the industry.

DRUG DESIGN AND TRAILIG:

Ai can optimize the pharmaceutical industry via its ability to enhancee R&D, from designing and figuring out new molecules to target-primarily based drug validation and discoveries.

Not only can it reduce the amount of time it takes for a trial to be conducted, however additionally to get approval, that means a drug can be positioned in the marketplace as quick as possible. This can result in cost savings, more treatment options and more affordable therapies one for those who need access to the medicine in question. [3]

MANUFACTURING IMPROVEMENTS:

By being involved with the pharmaceutical manufacturing manner, Ai can gift many opportunities to improve manufacturing tactics that have already been put into vicinity. These various control alternatives in production procedures encompass:

- Quality control
- Reduced layout time
- Predictive renovation
- Reduction of waste
- Improvement of production reuse

By allowing production to be optimized, end up quicker and more efficient, the pharmaceutical industry ought to advantage massively. Ai might do away with any older procedures that could usually rely upon the need of human intervention or input, removing any room for human error.[3]

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SYNTHESIS, CHARACTERIZATION AND ANTI-MICROBIAL EVALUATI QUINAZOLINE ANALOGS

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ABSTRACT

A series of substituted 6-bromo-3-(3-chloro-2-oxo-4-arylazetidin-1-yl)-2-methylquin synthesized and evaluated for their biological activity. The title compounds (G_1-G_{10}) were bromo anthranilic acid with acetic anhydride to form 6-bromo-2-methyl-4H-benzo[1 treatment with hydrazine hydrate in the presence of anhydrous pyridine form 3-amino-4(3H)-one. The resulting intermediate underwent Schiff reaction with different aromatic with chloroacetyl chloride and triethylamine. Ten different quinazoline derivatives (G_1-G_{1} assignments of these compounds have been made by elemental analysis, FTIR, ^{1}HNMR purity of the compounds was determined by TLC. The anti-microbial activity of the compounds was evaluated against Gram-positive, Gram-negative bacteria and fungi. Mos moderate degree of anti-microbial activity. The study concluded that the compound G significant anti-bacterial activity when compared to Amoxicillin as standard drug while co anti-fungal activity when compared to Fluconazole as standard drug.

Keywords: Amoxicillin, Anti-microbial activity, Aziridine, 5-bromo anthranilic acid, Fluc

1. INTRODUCTION

Quinazoline is a fused six-member aromatic ring (a benzene ring and a pyrimidine ring are fused). Quinazoline is a fused bicyclic compound earlier known as benzo 1, 3-diazine [1]. It was first prepared in the laboratory in 1903 by Gabriel. Although its derivative were known much earlier. The name quinazoline (German: Chinazolin) was first proposed for this compound by weddige on observing that this was isomeric with the compounds cinnoline and quinoxaline. Paal and Bush suggested the numbering of quinazoline

anti-cancer [5-8], anti-infla [11-14], analgesic [9,13], [16], anti-spasmodic [13, oxidant [19], anti-malarial anti-obesity [22], anti-psyc etc. Medicinal chemists quinazoline compounds by installing various acti moiety using developing applications of the quinaz biology, pesticides and

SYNTHESIS AND ANTI- OXIDANT SCREENING OF NOVEL SCHIFF BASES OF QUINAZOLIN 4-(3*H*)-ONE

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ABSTRACT: Quinazoline is an important class of heterocyclic compound, has been shown to exhibit diverse biological and pharmacological activities in different domain of research. In this study, a series of novel substituted 6-bromo-3-(3-chloro-2-oxo-4-arylazetidin-1-yl)-2-methylquinazolin-4(3H)-one have been synthesized with different aromatic aldehydes by using Schiff base reaction. The structures of all compounds were confirmed via a wide range of spectroscopic techniques including IR, ^{1}HNMR, Mass spectra and elemental analysis. All synthesized compounds have been tested for their in vitro antioxidant activities using 1,1-biphenyl-2-picrylhydrazyl (DPPH) as a free radical scavenging reagent by using ascorbic acid as a standard drug. The data reported herein indicates that compound G_3, G_6& G_8 has emerged as potentially active compounds as antioxidant compounds. All other synthesized compounds were found to possess moderate to significant antioxidant activities and could be useful as a template for future development through modification or derivatization to design more potent biologically active compounds.

Keywords: Anti-oxidant activity, Aromatic aldehyde, 5-bromo anthranilic acid, DPPH, Schiff base.

INTRODUCTION: Quinazoline is a fused six-member aromatic ring (a benzene ring and a pyrimidine ring are fused). Quinazoline is a fused bicyclic compound earlier known as benzo 1, 3-diazine[1]. It was first prepared in the laboratory in 1903 by Gabriel. Although its derivative were known much earlier. The name quinazoline (German: Chinazolin) was first proposed for this compound by weddige on observing that this was isomeric with the compounds cinnoline and quinoxaline. Paal and Bush suggested the numbering of quinazoline ring system, which is currently used[2-4]. The other less commonly used names for this ringsystem are 'phenmiazine' and 5, 6-benzopyrimidine. However, the name quinazoline is now universally accepted. Quinazoline derivatives, which belong to the N-containing heterocyclic compounds, have caused universal concerns due to their widely and distinct biopharmaceutical activities. Researchers have already determined many therapeutic activities of quinazoline derivatives, including anti-cancer[5-8], anti-inflammation[9-10], anti-bacterial[11-14], analgesia[9,13], anti-viral[15], anti-cytotoxin[16], anti-spasm[13,17], anti-tuberculosis[18], anti-oxidant[19], anti-malarial[20], anti-hypertension[21], anti-obesity[22], anti-psychotic[23], anti-diabetes[24] etc. Medicinal chemists synthesized a variety of quinazoline compounds with different biological activities by installing various active groups to the quinazoline moiety using developing synthetic methods. And the potential applications of the quinazoline derivatives in fields of biology, pesticides and medicine have also been explored.

Many exogenous chemicals in food systems and endogenous metabolic process in human body produce highly reactive free radicals, particularly free radicals that derive oxygen. Reactive oxygen species (ROS) such as superoxide anions, hydrogen peroxide, hydroxyl and nitric oxide radicals, play an important role in oxidative stress related to pathogenesis of many important diseases[25]. The ROS are constantly generated in the human body and are involved in various physiologically important biological reactions. Under physiological conditions, there is a balance between the production of reactive oxygen and a biological system's ability to detoxify the reactive intermediates. Oxidative stress occurs when the generation of ROS in a system exceeds the system's ability to eliminate them[26-28]. Excessive generation of ROS induced by various stimuli leads to many pathophysiological abnormalities such as inflammation, atherosclerosis, stroke, genotoxicity, diabetes, dementia and cancer. Antioxidants act as a major defence against radical mediated toxicity by protecting the damage caused by free radicals and have significant role in the prevention and

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SYNTHESIS, CHARACTERIZATION AND BIOLOGICAL EVALUATION OF NOVEL QUINAZOLINONE DERIVATIVES AS ANTI-INFLAMMATORY AGENTS

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Keywords:

5-chloro anthranilic acid, Quinazolinone, Anti-inflammatory activity, Diclofenac sodium

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ABSTRACT: A series of quinazolinone derivatives were synthesized and screened for anti-inflammatory activity. 5-chloro anthranilic acid undergoes acetylation in the presence of acetic anhydride and anhydrous sodium acetate to give 5-chloro-N-acetyl anthranilic acid as intermediate-I which upon cyclization in the presence of phosphorous pentaoxide, glacial acetic acid, and para aminobenzoic acid to yield 4-[6-chloro-2- methyl-4-oxoquinazolin -3(4H)-yl] benzoic acid as intermediate-II. This resulted in intermediate-II undergo mannich base reaction to produce novel quinazolinone derivatives (Q1 - Q16) on the reaction of formaldehyde with different aromatic amines. Sixteen different quinazolinone derivatives were synthesized. Structural assignments of these compounds have been made by elemental analysis, FTIR, 1H NMR, and mass spectral data. Among the synthesized compounds Q3, Q8, and Q 15 showed high anti-inflammatory activity against standard drug Diclofenac sodium. A majority of the tested compounds had shown good consequence to moderate anti-inflammatory activity.

INTRODUCTION: It is evident from the literature that, Quinazolinone is a heterocyclic compound play a vital role in synthetic, medicinal chemistry. The synthetic derivatives of quinazolinone are utilized as a therapeutic agent for combating against different pathological conditions. 5-chloro anthranilic acid is mainly employed for the synthesis of quinazolinone compounds as starting materials [1].

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Quinazolinone and its derivatives possess a major class of biologically active compounds which exhibited a large spectrum of therapeutic activities, including: anti-malaria [12], analgesic [3], antioxidant [4], anticancer [5], antiviral [16], anti-feedant [7], sedative-hypnotic [8], anticonvulsant [9], antimicrobial 10, antialgal [11], hypotensive [12] and anti-inflammatory [13].

Recently quinazolinone derivatives seek the great attention of researchers in organic and medicinal chemistry due to their prompt biological activities. Encouraged by the therapeutic diversity of quinazolinone containing moiety and the comparative ease of convertibility of anthranilic acid to quinazolinone, we took up the synthesis of certain novel quinazolinone from 5-chloro

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Microneedle-Based Transdermal Insulin Delivery System

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Abstract: *Transdermal drug delivery system is a novel approach, which is used to deliver the drug to the suitable skin surface so the drug is directly delivers to the systemic circulation. Transdermal insulin patches are designed to release insulin in control manner to the patient without causing pain. It is painful to deliver insulin through hypodermic injection or pump mediated infusion, there is some drawback to giving insulin through this route like patient who have a needle phobia, lowering adherence sometimes a risk of infection. Only a few drug we can deliver through the transdermal route because the stratum corneum layer of skin serves as the barrier for a drug so as only a few drug has a affinity to cross that barrier. Microneedle (MNs) technology relates to the pharmacy, micromachining, and polymer chemistry. It delivers insulin effectively into the systemic circulation across the skin, and does not affect the activity of insulin, as compare to subcutaneous injection. MNs cause less pain. This paper comprehensively discusses the properties, preparation of the microneedle. It includes hollow, solid, glucose- responsive dissolving and phase transition microneedle patches. Meanwhile, the challenges occur during the preparation, and clinical/commercial status of this delivery system are also discussed.*
Keywords: *Transdermal, drug delivery, Insulin, Microneedle.*

1. Introduction

Diabetes mellitus is chronic disorder that is caused by inherited or acquired inadequacy in the production of insulin by the pancreas or ineffectiveness of insulin produced. Sir Frederick G Banting, Charles H Best and JJR Macleod discovered insulin in 1921. In 1950 oral hypoglycemic agents come into use when a patient with Ketoacidosis was starving. Insulin hormones are produced by the beta cells of the islets of langerhans to the pancreas gland. Glucose therapy is essential to govern glucose levels for patients who suffer from type 1 diabetes and is generally used in advance type 2. Diabetes is induced by the failure of insulin release from pancreas [Type 1diabetes] or the impaired responsiveness of body [Type 2 diabetes]

Diabetes divided in following 2 type, Absolute insulin deficiency and restriction of beta cell.
Type1 diabetes is an autoimmune disorder devastation of beta cells which induces insulin. It is chronic illness of glucose homeostasis, overseeing progressively to insulin depletion and induces hyperglycemia. Evacuated untreated insulin deficiency may cause progressive metabolic insanity with worsening hypoglycemia, ketoacidosis starvation, and death. Type2 diabetes mellitus is two type- Relative insulin deficiencies, Insulin resistance gestational diabetes mellitus Exogenous administration of insulin is necessary for both class 1 and class 2 DM. Patients with diabetes have to self injected insulin multiple times a day further, self injection may need to training and self care. There are chances of microbial contamination in local tissue, necrosis and nerve damage.

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FEMALE PROTAGONISTS IN SHIVA TRILOGY

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RESEARCH ARTICLE

Formulation and Evaluation of Polyherbal Antiaging Cream

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ABSTRACT:
Moringa oleifera family Moringaceae and *Ocimum sanctum* family Labiatae has been reported to possess antioxidant, antimicrobial, antiinflammatory, antibacterial and antifungal properties. *Moringa oleifera* and *Ocimum sanctum* extracts have been used to treat antimicrobial infections. The aim of this present study is to formulate and evaluate of polyherbal anti-aging cream by combining the extract of *Moringa oleifera* with *Ocimum sanctum* to achieve multipurpose skin effects such as anti-aging, fairness, softening and antiseptic effects.The polyherbal anti-aging cream formulations comprising of hydroalcoholic extract of *Moringa oleifera* and *Ocimum sanctum*, carbapol 940, xanthan gum, stearic acid, glycerol monostearate and cetyl alcohol were prepared and evaluated for physicochemical parameters and the results showed the production of stable polyherbal anti-aging cream. The formulated polyherbal anti-aging cream (O/W) was subjected to characterize like visual inspection, pH, viscosity, good spreadability, good consistency, homogeneity, no evidence of phase separation and ease to washable from skin. Formulation (F4) exhibited fulfilled the objectives of the current research and % drug release is 98.78 and exhibit good anti-microbial activity.

KEYWORDS: Skin aging, Herbal Cream, Anti Aging, Poly Herbal, Skin care.

INTRODUCTION:

Skin aging is the result of a continual deterioration process because of damage to cellular DNA and protein. The ageing process is classified into two distinct types i.e. "Sequential Skin Aging" and "Photo Aging". Both types have distinct Clinical and Historical features. Sequential Skin Aging is the universal and predictable process characterized by physiological alteration in skin function. In the aging process keratinocytes are unable to form a functional stratum corneum and rate of formation of neutral lipids slows down, resulting in dry and pale skin with wrinkle. In contrast, Photo Aging is caused by over exposure to UV rays from sunlight. It is characterized by dry, pale and sallow skin, displaying fine wrinkles as well as deep furrows caused by the disorganization of epidermal and dermal components associated with elastosis and heliodermatis. Herbs and plants have already proved useful as tool in complementary medicine.[1,2]

Cosmetic products are used to protect against exogenous and endogenous harmful agents, and enhance the beauty and attractiveness of skin. The use of cosmetics not only developing an attractive external appearance, but towards achieving longevity of good health by reducing skin disorders. The synthetic or natural ingredients present in a skin care formulation that supports the health, texture, integrity of skin, moisturizing, maintaining the elasticity of skin by reduction of type I collagen, photo protection etc. This property of cosmetics is due to presence of ingredients in skin care formulations, because it helps to reduce the production of free radicals in the skin and manage the skin

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LINO

Monolithic Columns in Bio-analysis: A review

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Abstract

HPLC has its heart instilled in it named as columns which are responsible for separation and bifurcation of compounds present in a sample. Monolithic column is created in such a way that many channels form inside the column of HPLC. Manufactured with high-purity silica, high ligand density and fully capped, available in 100 mm, 50 mm, and 25 mm lengths for speed options. Monolithic filling utilized in chromatography is of unfathomable interest among the researchers since the elementary reports. These fillings were amalgamated and used for a long time, probably since silica-based monolithic sections were brought into the business market. Since then, various paper portraying their chromatographic properties and utilities in different areas of industry and analytical examinations were published. The examination of organic mixtures in natural examples, for example, blood plasma, urine, and tissue is fundamental to explain natural marvels. The analysis of drug and its metabolites after *in-vivo* administration is also important. Partition is viewed as quite possibly the main scientific strategies. Chromatographic strategies, particularly HPLC, have all the earmarks of being the most well-known, on the grounds that the methods take into account the partition of very confounded combinations of analytes.

Novel and modern approaches in biological sample preparation is the need of the hour .Many published studies showed the applicability potential of silica-based monolithic columns in investigations of various samples, including plants, dietary supplements, and drugs. This review is centered around potential utilization of economically and widely accessible silica based HPLC monolithic column in the examination of organic plant samples. Right now, two organizations produce solid segments dependent on silica for HPLC—Merck KGaA (Darmstadt, Germany) and Phenomenex (Torrance, CA, USA).Their products are available under trade names Chromolith® and Onyx™, respectively.

Keywords: Drug advances in columns and bio-analysis, Fixed stages in HPLC, Monolithic column, Plant material.

I. Introduction

Reverse phase chromatography for HPLC is a progressively creating strategy broadly utilized in practically all parts of industries and drugs synthetics and agricultural food examinations just as in lab practice and logical exploration [1]. The technique depends upon the separation of gold compounds from a matrix of samples containing different accompanying elements consequently the chromatographic section loaded up with the stationary stage where the partition cycle happens is named "the core of the chromatographic framework". At present segments with different sort of fillings are monetarily accessible nonetheless, circular pressed segments are still most normally utilized.

The irrefutable establishment of all monolithic sections was amazingly presented by (Svec et al)[2]. monolithic fixed stages were the subjects of interest for a few, research bundles throughout the most recent 30 years they are often times called "monolithic bars" [3] or "silica bars" of silica monolithic areas [4]. Due to the brand name structure that remembers them from standard round fillings and their different central focuses including low powerlessness to discouraging and low stream resistance they are an essential fascinating choice for certain analyst. Considering the sort of material used for amalgamation, monolithic portions can be isolated into two gatherings, the first relies upon silica gel and the second relies upon polymeric material[6]. Vyviurska et al. presented and intensive connection of two sorts of monetarily accessible monolithic [7]. That critical damage of most polymer is monolithic fillings is their

inability to isolate little particles[8], hereafter, their significance in the examination of test with an amazing network for instance plant material is less. They are for the most part of applied for examination of blends in with high sub nuclear weight, for instance, protein and poly-nucleotides [9,10,11,12] and they put forward more noticeable importance in electro - chromatography strategies [13,14]. Albeit polymeric monolithic sections are made by specific makers for instance BIA Partitions (Slovenia, Ljubljana) , Bio-Rad Research centers (Hercules, CA, USA), or Thermo Logical (Dionex Company) (Sunnyvale, CA, USA) [15], the vast majority of reports covers home-made fillings and, in these cases the duplicatability of results is difficult to get considering the way that the pattern pf association droves by different experts may to some degree of contrast[14,16].

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RESEARCH ARTICLE

Formulation, Optimitziation and Evaluation of Polyherbal Anti-Dandruff Shampoo

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ABSTRACT:
Psidium Guajava, family Myrtaceae and Glycyrrhiza Glabra family Leguminosae has been reported to possess antioxidant, antimicrobial, antiinflammatory, antibacterial and antifungal properties. Gauva and Liquiorice extracts have been used to treat antimicrobial infections. It contain several chemicals compound such as flavonoids, tannins, phenols, triterpenes, saponins, to take the benefit of the nature of extract. Psidium Guajava and Glycyrrhiza Glabra prepare shampoo incorporating in the herbal constituent base and evaluate this natural herbal shampoo. The herbal shampoo formulations comprising of hydroalcoholic extract of Psidium Guajava and Glycyrrhiza Glabra (ethanol:water 80:20v/v), coconut oil, castor oil, cymbopogon citrates oil were prepared and evaluated for physicochemical parameters such as visual appearance, pH, viscosity, % of solids content, foaming capacity and the results showed that the formulation F4 of anti-dandruff herbal shampoo contains all good characters of an ideal shampoo and it was found to be harmless, more effective, ease of manufacturing and economical compared to synthetic antidandruff shampoo.

KEYWORDS: Dandruff, herbal anti-dandruff shampoo, lemon grass oil, liquorices and guava leaf.

INTRODUCTION:
Dandruff is a chronic scalp condition, which involves excessive shedding of dead skin cells from the scalp. It is caused by a fungus called Malassezia Restricta and Malassezia Globosa. Malassezia formerly called Pityrosporum is a yeast causing infection of skin and scalp. Dandruff is caused due to excessive shedding of dead skin cells from the scalp. It affects 5% of the population and mostly occurs after puberty, between 20 to 30 years, and dandruff affects males more than females. The skin of scalp renews itself about once a month. Usually, scalp sheds dead cells in nearly invisible way, but sometimes cell turnover becomes unusually rapid and dead cells are shed as visible flakes called dandruff. Warm and humid atmosphere, overcrowding, and poor personal hygiene promote the growth of Malassezia.[1,2]

Anti-dandruff shampoo is a type of shampoo which contains anti-dandruff agent and it is mainly used to prevent or treat dandruff from the scalp of hair. Two types of anti-dandruff shampoos are commercially available.

A. Synthetic anti-dandruff shampoo
B. Herbal anti-dandruff shampoo

Herbal anti-dandruff shampoos:
Herbal anti-dandruff shampoos are the cosmetic formulations which contain herbal ingredients such as plant extracts and essential oil. These herbal shampoos are generally used to remove the dandruff, to add natural color to the hair, to remove the extra oil content of the hair, for the healthy growth of the hair, to remove the dust and scales of the scalp, to prevent hair falling, to impart softness and smoothness to the hair shaft, etc. They can penetrate to the root shafts, stimulate the sebaceous glands, enhance the blood circulation and impart greater strength to the hair root and the shaft. They are also used against alopecia, thinning, clubbing,

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REVIEW ARTICLE

Int J Pharm Bio Sci Volume 12 Issue 2, 2021 (April-June), Pages:18-26

Current trends, Development and Applications of Analytical and Bioanalytical Techniques - A review

Gurmeet S. Chhabra

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Abstract:

Drug development plays a key role in curing the diseases and improving human health. The pharmaceutical product need to maintain the quality, free from various possible degradants, possible contaminants and to be administered in a proper amount to provide the therapeutic effect. These drugs may develop impurities at various levels from its development to storage, which creates a risk for its administration. The need of an hour is to evolve a systematic approach and to develop well-designed, hyphenated and advanced instrumental techniques for the purpose of drug estimations. The advancement of analytical and bioanalytical techniques with enough accuracy, selectivity, sensitivity, speed, robustness, resolution, use of solvents, cost factors etc is thus bringing a new era of development which will serve as a rapid and unambiguous tool for the estimation and quantitation of drugs. This advancement in technique is also applicable for environmental analysis, food analysis, plant analysis, insecticides, nutraceuticals and other bioactive compounds hereby setting up quality standards and specifications for seeking the regulatory authorities approval. The purpose of this review is to highlight a variety of recent and advanced extraction, analytical and bioanalytical techniques, their corresponding principles and applications that are used in the analysis of not only the synthetic drugs, but also for the quantitative and qualitative evaluation of herbal medicines and its formulations.

Keywords: Microwave-assisted extraction, Biosensors, Microarray, Nanotechnology, High-temperature liquid chromatography, Microextraction.

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Review Article

QUALITY BY DESIGN APPROACH: REGULATORY NEED, CURRENT, AND FUTURE PERSPECTIVE

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ABSTRACT

Quality by design (QbD) is utilized in the event of pharmaceutical processes to create certain predefined product quality. QbD ideas unit of measurement explained in International Conference on Harmonization (ICH) pointers Q8 (R1) (Pharmaceutical development), Q9 (Quality risk management [QRM]), and Q10 (Pharmaceutical quality system). ICH Q8 (R1) guideline defines QbD as "a systematic approach to develop that begins with predefined objectives and emphasizes product and methodology, understanding, and methodology management, supported sound science and QRM." QbD approach studied the implications of various input variables (e.g. methodology parameters, and materials) of the merchandise development methodology, on the final word product (active pharmaceutical ingredient or drug product). The late QbD approach integrates the principles of QRM, and methodology analytical technology (PAT). QbD combined with methodology analytical technology (PAT) tools modify methodology management and increase assurance that the merchandise quality attributes unit of measurement achieved consistently. An integrated and risk-based approach r review of the merchandise development methodology is also a future need of the QbD plan. Although implementing the QbD approach is not a restrictive demand, restrictive agencies to supply flexibility in their pointers for producing that unit of measurement developed by the QbD approach. Rising trends embody the growing interest in quantifying and managing the impact of raw materials' attributes variability of methodology and product, what is more, as a result of the event of retrospective QbD approaches in complement to simple QbD. Thus, the QbD approach is also a tool for developing worth effective and quality pharmaceutical products.

Keywords: Quality by design, Risk management, International conference on harmonization guidelines, Retrospective quality by design.

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INTRODUCTION

The aim of the pharmaceutical company is based on manufacturing and innovation a quality product. The pharmaceutical company is constantly working to empower and ensure the safety, quality and efficacy of the product. However, drug recall, manufacturing failure, cost, scale-up issues, and burden in recent are some challenging factors for the industry. In traditional, the finished product evaluation unit ensures product quality and performance, with a limited understanding of the process and critical process parameters (CPP's). Regulatory bodies are therefore focused on implementation through quality by esign (QbD) [1,2]. QbD is a science-based approach that reduces process variation and enabling process control strategies which result in improved process understanding and reliability. We do not have to rely on finishing product testing only, QbD provides transparency in the overall development process so that the quality issues can be analyzed efficiently and also, we can find and solve the basic problem quickly and efficiently. The requirement of QbD is determining the extent to which any changes can impact on the finished product quality. And, also the identification of all critical formulation attributes and related process parameters [3,4].

Definition (ICH [international conference on harmonization] Q8 [R1])

A systematic approach to development that begins with a predefined objective and emphasizes product and methodology, understanding and methodology management, supported sound science, and quality risk management (QRM) [5].

Definition (food and drug administration process analytical technology [FDA PAT] guidelines)

A system for designing, analyzing, and dominant manufacturing through timely measurements (i.e. throughout processing) of crucial quality and performance attributes of recent and in-process materials and processes to construct bounding final product safety.

QbD thought was printed as a result of the modern approach to the development of crucial methodology and quality product supported knowledge base throughout the event section of the merchandise [6].

HISTORY AND BACKGROUND

Quality intentionally (QbD) could be an idea introduced by the standard pioneer Dr. Joseph M. Juran believed that quality ought to be designed into a product, which most quality crises and issues related to the means within which a product was designed within the 1st place. Limicoline bird undoubtedly a high-quality drug product as a product free from contamination and faithfully delivering the therapeutic profit secure on the label to the patron.

In 2002, a new initiative by a federal agency for risk management (cGMP for the 21st century: a risk-based mostly approach). This began to modernize the regulation of FDA for pharmaceutical quality and to initiate a brand-new regulative framework supported QbD management of risk and quality system. This newer idea by FDA-cGMP initiative, two documents introduced by the ICH, for guiding the standard, that is, ICH-Q8: (pharmaceutical development) and ICH-Q9: (QRM).

In the gift century, the pharmaceutical business permits a lot of freedom to introduce new ideas, innovations, and enhancements which will enhance quality, cost, or timing [7-9].

BENEFITS OF QbD

QbD could be a sensible business that eliminates batch failures and minimize deviations and expensive investigation. QbD additionally avoids regulative compliance issues and structure learning could be reasonably invested within the future. Overall, QbD is sweet science that offers higher development selections and management of technical employees.

QbD is an economical, agile, and versatile system. It ensures consistent info and a much better risk management; a knowledge domain is made

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RESEARCH ARTICLE

Stability indicating RP-HPLC method for the determination of Tenofovir in pharmaceutical formulation

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ABSTRACT:
Stability indicating high performance liquid chromatography (HPLC) method was developed for the assay of Tenofovir in bulk and solid dose formulation. The HPLC separation was achieved on kromasil C18 (100mm × 4.6mm, 5 µm) column using a mobile phase of Methanol: Potassium dihydrogen orthophosphate buffer (30:70,v/v) at a flow rate of 1 ml min^{-1} and UV detection at 260 nm. Peak elutes at 7.33 appropriate. The method was validated for linearity, repeatability, accuracy, precision, robustness, limit of detection and limit of quantification. The accuracy was between 99.14 - 99.97%. The highest R.S.D. amongst interday and Intraday precision was found 0.808 and 0.473 respectively.The assay was linear over the concentration range of 10-50 µg/ml (R≈0. 999). The method was robust as no significant change in chromatographic parameters. LOD and LOQ was found to be 0.90 and 2.71 respectively. The stress studies were performed per ICH guidelines to confirm its Stress testing was carried out in presence of acid, base, hydrogen peroxide, heat and light to demonstrate specificity of the method as per ICH guidelines. The developed method could separate the potential degradation products from the Tenofovir peak. It was concluded that highest degradation occurs in basic condition. This proposed method was suitable and practical for analysis the content of Tenofovir in pharmaceutical products and could be of benefit for the prediction shelf life of Tenofovir in marketed formulations.

KEYWORDS: Tenofovir; Liquid Chromatography; Assay; Development; Validation

INTRODUCTION:

Tenofovir Alafenamide Fumarate (TAF) belongs to the class of nucleotide reverse transcriptase inhibitor (NRTI). It is a novel ester prodrug of the antiretroviral Tenofovir. It is chemically called as (2E)but-2-enedioicacid; bis(propan-2-yl(2S)-2-{[(S)-({[(2R)-1-(6-amino9H-purin-9-yl)propan-2yl]oxy}methyl)(phenoxy)phosphoryl]amino}propanoate).It has a molecular formula of$C_{23}H_{31}N_6OP$ and a molecular weight of 476.47 g/mol. It has the following structure (Figure 1) It is Slightly soluble in water, soluble in methanol, very slightly soluble in dichloromethane.[1,2]

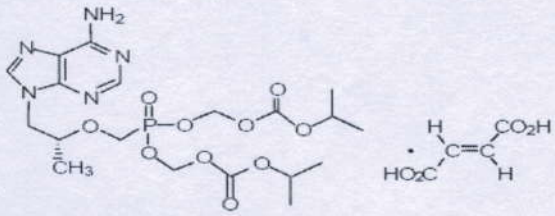

Fig. 1. Structure of Tenofovir

Several high-performance liquid chromatography (HPLC) methods have been published for direct analysis of Tenofovir in bulk materials and formulations in pharmaceutical product[3,16]. However, the purpose of this work was to develop and validate an economical, simple and stability-indicating HPLC method for Tenofovir bulk materials and pharmaceutical formulations using a C18 column for chromatographic separation followed by UV detection at 260 NM. Stress testing was carried out to demonstrate specificity of the method. [17] The developed method could be applied for prediction of shelf life of Tenofovir in related pharmaceutical

An Epidemiological Observation of Judicious use of Antibiotics in Dhar District, M.P. (India)

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ABSTRACT

Background: Antibiotic resistance is presently the gigantic challenge to the effective treatment of infections globally. It is a rapidly growing clinical problem and public health threat. Promiscuous use of antibiotics is epidemic in India and this is an affair of consequential concern. Irrational use of antibiotics can cause increase adverse drug reaction, lead to antibiotic resistance and increase the treatment cost. Antibiotic resistance unfavourably influence both clinical and financial therapeutic results, with repercussion ranging from the failure of an individual patient to respond to therapy and the need for costly and/or toxic alternative medicine to the social cost of higher morbidity and mortality rates, longer duration of hospitalization and the need for changes in empirical therapy. Analysing the antibiotics utilization pattern is significant in the context of its escalating use and its overall impact on the health care system. **Materials and Methods:** An observational and prospective study was conducted by interviewing (using a data collection form) the patients to evaluate the utilization of antibiotics in multispecialty hospital, Dhar district, Madhya Pradesh, India. **Results:** Out of 102 patients interviewed, 85 (83.33%) were prescribed antibiotics either alone or in combination with other drugs. The maximum number of patients received antibiotics belongs to the age group of 31-40 (22, 18.7%). Ciprofloxacin (25, 21.25%) was the widely prescribed antibiotics followed by metronidazole (20, 17%) penicillin (15, 12.75%), azithromycin (12, 10.2%) cephalosporin (11, 9.35%) and amoxicillin (10, 8.5%). Maximum prescriptions of antibiotics were for high grade fever (29, 24.65%) followed by gastrointestinal infection (18, 15.3%). **Conclusion:** Proper strategy like antibiotic policy and educational intercession are necessary to control the excessive use of antibiotics in health care settings.

Key words: Antibiotics, Drug utilization, Antibiotic Resistance, Observational study, Prospective study.

INTRODUCTION

Antibiotics are among the most widely prescribed medications both in the hospital setting and the community setting. Resistance to antibiotics becomes a major threat to public health due to escalating consumption of antibiotic.[1] Bacterial resistance to antibiotics is an increasing clinical issue worldwide and estimated to cause 10 million deaths annually by 2050.[2,3] Excessive use of antibiotic is a primary driver of antibiotic resistance and reducing antibiotic use is a central strategy for confronting resistance.[4] There are various reasons for escalating use of antibiotics includes rising incomes, health insurance and burden of infectious worldwide.[5] In the United States, over 2 million people are affected with antibiotic-resistant infections each year, account for at least 23,000 deaths and have a total economic burden that exceeds $ 20 billion in direct healthcare costs alone.[6] In India, 20% to 50 % of all antibiotics used are appearing to be used not only in excess but also inappropriately.[7] If the current scenario does not change, there will be economic losses of 100 trillion dollars due to resistant infections worldwide.[8]

Because of high treatment costs associated with the resistant infections and limited access to antibiotics, India is assailable to the loss of antibiotic efficacy.[9] It has been estimated that by 2050, 700,000 deaths per year occur inevitably to antimicrobial resistance and, there might be 10 million deaths per year.[8] Bacteria causing common or severe infections have developed resistance to varying degrees to each new antibiotic coming to market since over several decades.

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Formulation Development and Evaluation of Poly Herbal Hair Oil for Hair Growth Stimulating Activity

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Abstract

Herbal formulations always have attracted considerable attention because of its lesser and nil side effect compared with synthetic drugs. The concept of beauty and cosmetics are an ancient as mankind and civilization. Various herbal beauty products are widely used and continuously increasing in their demand by the common people because of lesser side effects and with better safety and security profile The objective of the present study is to prepare poly herbal hair oil using *Emblicaofficinalis* (Amla), *Eclipta prostrate* (Bhringraj), *Azadiractaindica* (Neem), *Tinosporacardifolia* (Giloy), *Bacopamonnieri* (Bramhi), *Mesuaferra* (Nagkesar), *Cyperus rotendus* (Nagarmutha), *Nardocstachys jatamansi* (Jatamansi), *Psoralia caryfolia* (Bakuchi), *Acorous calamus* (Vacha) and *Abrus precatorious* (Gunja). The six different oil formulations were prepared using different oil base either single or in combinations with different concentrations.

For the purpose the powdered drugs soften by cold maceration process for overnight and further the extraction was done in oil base by boiling method. The formulated herbal oils of different concentrations were evaluated for proximate analysis and various parameters such as Viscosity, Saponification value, pH, Acid value, Grittiness, Skin irritation, Sensitivity test, Moisture content, and Specific gravity are reported in this paper. Further the prepared oils will be evaluated for their hair growth stimulating activity.

Keywords: Hair, polyherbal, Oil, maceration, evaluation

Introduction

Hair is one of the imperative parts of the body derived from ectoderm of the skin, it is ornament structure along with sebaceous gland. Hair is a dead part with no nerve connections. The hair follicle has the unique ability to regenerate itself [1-3]. The basic part of hair is bulb (a swelling at the base which originates from the dermis), root (which is the hair lying beneath the skin surface), shaft (which is the hair above the skin surface) [4]. Hair germs begin from an aggregation of keratinocytes in the stratum basal of the epidermis. The initiating factor is the underlying dermal fibroblast cells [1].

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ANTIEPILEPTIC DRUG SAFETY IN PREGNACY: - POSSIBLE DANGERS FOR THE PREGNANT WOMEN AND HER FOETUS

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ABSTRACT

Epilepsy is the common chronic neurological disorder which affects four to ten people per thousand. The affected people include most of women of child bearing age and women require long term treatment with AEDs drug. When the patient takes antiepileptic drugs, safety related matter arises in pregnant women. These may include safety of both women and their foetus. Drug doses should also be managed or balanced that the AEDs could not get metabolised or excreted from the body. If AEDs are consumed for long duration, the body becomes habitual to the drug and creates resistance to it. Therefore, the dose or dosages should increase or changed. Some AEDs may affect foetus due to the exposure of drug to intrauterine. The infant will also get affected and born with some disorder like lower IQ values and outism spectrum disorder etc. This article reviews about Epilepsy, AEDs effect on pregnant women and foetus and safety precautions to be taken.

KEYWORDS: AEDs (Antiepileptic drugs), epilepsy autism spectrum, disorder neurological.

INTRODUCTION

Epilepsy is common neurological disorder in which the neuron's activity in brain is disturbed which causes seizure. It may be genetic disorder or an acquired brain injury such as trauma or stroke. AED drugs are used to treat epilepsy. Some types of epilepsy are treated or cured by surgery while some types do not have any cure. Some common types of AEDs are carbamazepine, clobazam, gabapentin etc. The pregnant women affected by epilepsy cannot be given the drugs used forepilepsy for normal people. Women with epilepsy do not have normal body conditions that are irregular menstrual cycle, anavulatory cycles, reproductive

Marble-burying behavior test as a murine model of compulsive-like behavior

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Abstract

Object burying by rodents is a popular screening tool for anxiolytic agents. However, modulation of marble-burying by serotonin reuptake inhibitors prompted its link to obsessive-compulsive disorder/compulsive-like behavior. The Marble-burying behavior test is an acute test; however, some investigators incorporate the sub-acute treatment regimen as an essential component for screening anti-compulsive agents. The test exhibits between-laboratory methodological differences and demonstrates positive treatment responses to an array of pharmacotherapies, creating doubts about its predictive validity and construct validity.

Numerous reviews are available on marble-burying behavior test, which incorporates the test as a part of anti-compulsive behavior-like screens, but none has made it a sole subject-matter for discussion. This review attempts to provide a comprehensive account of the marble-burying test as a model of compulsive-like disorders. It envisages the model's scientific origins, the preclinical research done in various laboratories and its correlation with the clinical research outcomes, and a detailed discussion about its validity. In conclusion, there appears a need to address the issue of construct and predictive validity of the model authoritatively; or the paradigm may remain squandered in the field of obsessive-compulsive disorder research.

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A Review: Biopesticides Its Formulation and Its Significance

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Keywords: viruses, bacteria, fungi, chemical fertilizers, herbal pesticides

ABSTRACT

Biopesticides including entomopathogenic viruses, bacteria, fungi, microscopic organisms, parasites and other plant optional metabolites are utilized as a supplant of substance manures with the elective safe approach for people and non-targeted organism, this has led to expand the utilization of Biopesticides as they are a significant segment of Integrated pest management (IPM) program. There are a few classes of biopesticides-utilized microbial, plant Incorporated, biochemical, and semiochemical pesticides out of which biochemical pesticides (Herbal pesticides)are beneficial in use because they use non-toxic and natural mechanisms to kill or inactive the pest. This paper reviewed into the present status information on Biopesticides featuring its idea, the likely utilization of biopesticides, it's classifications, detailing, points of interest and burdens, progression in innovation, and empirical data on components of activity of biopesticides on broader control.

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FORMULATION AND EVALUATION OF HERBAL FACE PACK

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ABSTRACT

The objective of this drive is to create and evaluate bundle of pure ingredients for glowing skin With various concentrations, 4 high-quality formulations containing various elements such as multani mitti, turmeric, aloe vera, sandal wood, orange peel, neem has been prepared named as F1 to F4. All organized formulations have been evaluated by potential of different parameters like organoleptic residences

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FORMULATION DESIGN AND EVALUATION OF FAST DISSOLVING TASTE MASKED TABLET OF LAFUTIDINE

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ABSTRACT

Lafutidine is a cytoprotective H2 receptor blocker with greater potency and practically insoluble in water with bitter taste. In the present study, an attempt has been made to improve the solubility of drug by solid dispersion technique and masked the bitter taste by complexation technique. PEG 4000, PEG 6000 and PEG 8000 were used as a carrier with drug in solid dispersion technique to enhance the solubility of drug. Beta cyclodextrin and Hydroxypropyl betacyclodextrin were used as a complexing agent in formulation of complexes with the drug by physical and kneading method. The drug complexes were evaluated for bulk density, angle of repose, taste masking and in vitro drug release. In vitro drug release studies showed more than 90% drug release from the optimized formulation within 30 min. Hydroxypropyl betacyclodextrin was found to be better complexing agent by kneading method for masking the bitter taste of drug while PEG 6000 out of PEG 8000 and PEG 4000 give better dissolution profile.

Introduction

A fast dissolving tablet system can be defined as a dosage form for oral administration, which when placed in mouth, rapidly dispersed or dissolved and can be swallowed in form of liquid.The benefits, in terms of patient compliance, rapid onset of action, increased bioavailability and good stability make these tablets popular as a dosage form of choice in the current market. Lafutidine is a superior and novel second generation H_2 receptor antagonist, proton pump inhibitor with gastro protective activity.It is 8-20 times more potent. The main objective of this study is to improve palatability by increasing solubility and masking the bitter taste of drug.

Materials

Drug was gifted byPure Chem PVT LTD. Gujarat. Cross carmellose sodium was obtained from Vama pharma, Nagpur. Camphor and ammonium bicarbonate was procured from Shanti chemicals, Chennai. All the chemicals and reagents were of analytical grade.

Method

Characterization of the drug Lafutidine and formulation additives, followed by spectrometric and thermal characterization. Solubility enhancement and taste masking of drug achieved by physical mixing and kneading method with beta cyclodextrin (βCD) and Hydroxypropyl beta cyclodextrin (HPβCD). Afterthat, formulation of taste modified tablet of Lafutidine by sublimation method and Evaluation of optimised formulation and stability studies was conducted.

Table 1: Formulation of fast melting / dissolving tablet of Lafutidine prepared by sublimation method.

Ingredients (mg)	FS1	FS2	FS3	FS4	FS5	FS6	FS7
Lafutidine (Complex)	42	42	42	42	42	42	42
Camphor	2.0	3.0	4.0	-	-	-	-
Ammonium bicarbonate	-	-	-	2.0	3.0	4.0	-
Cross carmellose sodium	5%	5%	5%	5%	5%	5%	5%
Mannitol	49.5	48.5	47.5	49.5	48.5	47.5	51.5
Aspartame	1%	1%	1%	1%	1%	1%	1%
Magnesium stearate	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%

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FORMULATION DESIGN AND EVALUATION OF WATER DISPERSIBLE TABLET OF GUAIFENESIN FOR PAEDIATRIC USE

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ABSTRACT

Generally more often or so young children suffer from spells of cold and cough. Cough isone of the most common symptoms of childhood illness. The coughing has been classified into various types however, barking, whooping types of cough are quite severe. Most widely used dosage form for children include cough syrups or suspension. However, dispersible tablets offer advantage of both liquid and solid dosage forms. Dispersible tablets are unique class of tablets that disintegrate rapidly in water to form a stabilized suspension or when placed on toung, disperse instantaneously in the mouth. This property makes them more convenient for oral administration than conventional tablets. Guaifenesin is expectorants for treatment of cough. It has a bitter taste which deters its use in the pediatric patients.Because of this, the compliance of these patients with its dose regimen poses a great challenge. This results in insufficient therapeutic benefits of the expectorant therapy. Hence, present studies are undertaken to mask the bitter taste of Guaifenesin by complexation technique and to design dispersible tablet formulation, a suitable dosage form for pediatric patients. Weak cation exchange resin Kyron - T114 and Indion 214 were used in formulation of complexes with drug. PEG 4000 and PEG 6000 were used for solid dispersion technique by solvent evaporation technique to mask the bitter taste of drug. The complexes were evaluated for bulk density, angle of repose, taste masking and in vitro drug release. In vitro drug release studies showed more than 95% drug release from the optimized formulation within 30 min. Kyron T114 (1:1) was found to be better complexing agent for masking the bitter taste of guaifenesin.

Keywords: Cough, whooping cough, Guaifenesin

Introduction

Cough is one of the most common symptoms of childhood illness. Most widely used dosage form for children include cough syrups or suspension. However, dispersible tablets offer advantage of both liquid and solid dosage forms.They are unique class of tablets that disintegrate rapidly in water to form a stabilized suspension or when placed on tongue, disperse instantaneously in the mouth which makes them more convenient for oral administration than conventional tablets. Guaifenesin is an expectorantfor treatment of cough having bitter taste which deters its use in the pediatric patients. Because of this, the compliance of these patients with its dose regimen poses a great challenge. This results in insufficient therapeutic benefits of the expectorant therapy. Hence, present studies aims to mask the bitter taste of Guaifenesin by complexation technique and to design dispersible tablet formulation, a suitable dosage form for pediatric patients.

Materials and Methods

Guaifenesin was generously gifted by Vama pharma, Kyron T114 was procured from Corel pharma, Ahmedabad, Aspartame, Indion 214, Cross carmellose sodium was procured from Vama pharma, Nagpur. All the chemicals and reagents were of analytical grade.

Experimental Work

Characterizationof drug and excipients by physiochemical properties and spectrometric analysis, after that, tastemask of drug using solid dispersion by solvent evaporationtechnique with PEG 4000 and PEG 6000 in ratio of 1:1, 1:3 and 1:5 and complexation with ion exchange resinwith Kyron T-114 and Indion -214 in the ratio of 1:1, 1:2, and 1:3. Then, evaluation of taste modified drug samples by organoleptic and functional properties. Finally, formulation and evaluation of water dispersible tablet formulation of taste masked Guaifenesin and Stability testing of water dispersible tablet was done.

Results and discussion

The study of drug resin complex with Indion 214 and Kyron T114 showed that guaifenesin resinate with Kyron T114 (1:1) gave best drug loading as 92.80% and the drug content of resinate was 96.91 and Indion 214 gave drug loading 86.80% and drug content 88.60%. Hence, drug resiante complex

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Antifeedant Activity of Pyrazolin-5-One Derivatives

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Authors' contributions

This work was carried out in collaboration among all authors. Author RP designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors GS and SM managed the literature searches. All authors read and approved the final manuscript.

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Original Research Article

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ABSTRACT

A series of substituted 4-{1-aza-2-[(aryl) amino)]}-3-methyl-2-pyrazolin-5-ones has been synthesized and evaluated for their biological activity. The title compounds (4a-l) were prepared by the diazotization of substituted anilines (1a-l) to form substituted phenyl hydrazine derivatives (2a-l) which synthesized substituted 4-{1-aza-2-[(aryl) amino)]}-3-methyl-2-pyrazolin-5-ones (4a-l) by Michael addition reaction, which is a nucleophilic addition of enolate anion to the carbon-carbon double bond of a α, β–unsaturated carboxylic acid derivatives. Twelve different pyrazolinone derivatives (4a to 4l) were synthesized. Structural assignments of these compounds have been made by elemental analysis, FTIR, ^{1}HNMR and Mass spectral data and the purity of the compounds was determined by TLC. The antifeedant activity of the newly isolated heterocyclic compounds was evaluated against agriculture pest *Achoea janata*. Compound 4d found to be very effective as antifeedant while rest of the compounds showed a moderate to good degree of antifeedant activity.

Keywords: Antifeedant activity; carbindazime; diazotization; michael addition reaction; Pyrazolin-5-ones.

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DESIGN AND SYNTHESIS OF SOME NEW DERIVATIVES OF QUINAZOLINONE WITH PROMISING ANTI-CONVULSANT ACTIVITY

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ABSTRACT:

A number of 4-[6-chloro-2-arylaminoethyl-4-oxoquinazolin-3(4H)-yl] benzoicacid derivatives have been synthesized. Their structures have been elucidated on the basis of elemental analysis and spectroscopic studies (FTIR, ^{1}HNMR and Mass) and the purity of the compounds was determined by TLC. A preliminary evaluation of the anti-convulsant properties of the prepared compounds has indicated that some of them exhibit moderate to significant activity, compared to diazepam standard.

Keywords:5-chloro anthranilic acid, Anti-convulsant activity, Diazepam, Mean Convulsion Threshold, Quinazolinone

INTRODUCTION:

Epilepsy is a cerebrum issuedescribed by frequency of more than one epileptic seizure with persistent tendency to produce further epileptic assaults connected with neurobiological, mental, sociological, economic, and culturalinfluences[1, 2]. It has now become the severe syndrome, which accounts for about 1-2% of the world's problem of ailments [3], affecting nearly 40-50 million of manhood with the common of cases existence in developing nations [4, 5].

Each year nearly 0.25 million new cases are added to this digit [5, 6]. It was reported that the occurrence of epilepsy is greater in rural (1.9%) as related to the urban people (0.6%) [7, 8]. Even though the ideal use of existing antiepileptic drugs, 30% of patients with epilepsy proceed and others experience the seizure control just to the detriment of deplorable prescription-related

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Research Article

Evaluation of Analgesic Activity of Some Novel Quinazolinone Analogues

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Abstract

The synthesis, characterization and spectroscopic studies of new quinazolinone substituted analogues Q_1 - Q_{16} with analgesic activity were described. A series of novel quinazolinone derivatives were synthesized. In this view, 5-chloro anthranilic acid undergoes acetylation in the presence of acetic anhydride and anhydrous sodium acetate to give 5-chloro-N-acetyl anthranilic acid as intermediate-I which upon cyclization in the presence of phosphorous pentaoxide, glacial acetic acid and para amino benzoic acid to yield 4-[6-chloro-2-methyl-4-oxoquinazolin-3(4H)-yl] benzoic acid as intermediate-II. This resulted intermediate-II undergo mannich base reaction to produce novel quinazolinone derivatives on reaction of formaldehyde with different aromatic amines. All the synthetic derivatives were fully characterized by spectral analytical data (elemental analysis, FTIR, 1H NMR and Mass) and the purity of the compounds was determined by TLC. Analgesic activities were tested via both hot plate and acetic acid induced writhing methods. The study concluded that the compound Q_5, Q_8 and Q_9 were found to exhibit significant analgesic activity when compared to Ibuprofen as standard drug while other derivatives exhibit moderate to good analgesic activity.

Keywords: 5-Chloro Anthranilic Acid; Quinazolinone; Analgesic Activity; Ibuprofen

Introduction

It is evident from literature that, Quinazolinone is a heterocyclic compound play vital role towards synthetic medicinal chemistry. The synthetic derivatives of quinazolinone are utilized as therapeutic agent for combating against different pathological conditions. 5-chloro anthranilic acid mainly employed for the synthesis of quinazolinone compounds as starting materials [1]. Quinazolinone and its derivatives possess a major class of biologically active compounds which exhibited large spectrum of therapeutic activities including; anti-malarial [2], analgesic [3], antioxidant [4], anticancer [5], antiviral [6], antifeedant [7], sedative-hypnotic [8], anticonvulsant [9], antimicrobial [10], antialgal [11], hypotensive [12] and anti-inflammatory [13]. Recently quinazolinone derivatives seek great attention of researchers in organic and medicinal chemistry due to their prompt biological activities. Encouraged by the therapeutic diversity of quinazolinone containing moiety and the comparative ease of convertibility of anthranilic acid to quinazolinone, we took up the synthesis of certain novel quinazolinone from 5-chloro anthranilic acid and evaluated their analgesic activity [14].

Materials and Methods

All the chemicals used in the synthesis of the intermediates and final derivatives were of A.R grade and procured from the Merck and LOBA chemicals. All the synthesized quinazolinone derivatives were characterized by melting point determination using Veergo digital melting point apparatus in open capillary tubes and were uncorrected.

IR Spectra were recorded using Perkin Elmer FTIR spectrophotometer using KBr pellets techniques and ^{1}HNMR spectra of the synthesized compounds in deuterated DMSO were recorded on BRUKER AVANCE II 400MHz NMR Spectrometer instrument using TMS as the internal standard. Mass Spectra were recorded using LC-MSD-Tranp-SL2010A SHIMADZU using Dimethylsulphoxide (DMSO) as solvent. TLC was performed using silica gel GF_{254} coated plates of 0.25 mm thickness. Ethyl acetate, petroleum ether, chloroform (0.6:0.8:8.6) were used as solvent system and iodine vapors as visualizing agent.

Scheme of synthesis

(Figure and Table 1)

The experimental work comprises in three steps:

1. Step-I: Synthesis of 5-chloro-N-acetyl anthranilic acid from 5 -chloro anthranilic acid.
2. Step-II: Synthesis of 4-[6-chloro-2-methyl-4-oxo quinazolin-3(4H)-yl] benzoic acid.
3. Step-III: Synthesis of various derivatives of quinazolinone by mannich reaction.

Step-I: General procedure for the synthesis of 5-chloro-N-acetyl anthranilic acid from 5-chloro anthranilic acid (Intermediate-I)

5-Chloro anthranilic acid (0.02 moles) was mixed with an equimolar quantities of anhydrous sodium acetate (0.03 moles) and

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SYNTHESIS AND BIOLOGICAL EVALUATION STUDIES OF NOVEL BENZO-1,3-DIAZINE DERIVATIVES AS ANTI-INFLAMMATORY AGENTS

Pawan Tiwari, Gurdeep Singh, Dhermendra Shrivastav, Ashok Baghel , Ritesh Patel, Vinod patidar

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Abstract

A series of substituted 6-bromo-3-(3-chloro-2-oxo-4-arylazetidin-1-yl)-2-methylquinazolin-4(3H)-onehas been synthesized and evaluated for their biological activity. The title compounds (G_1-G_{10}) were prepared by the reaction of 5-bromo anthranilic acid with acetic anhydride to form 6-bromo-2-methyl-4H-benzo[1,3]oxazin-4-one which upon treatment with hydrazine hydrate in the presence of anhydrous pyridine form 3-amino-6-bromo-2-methylquinazolin-4(3H)-one.

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Original Research Article

Analytical Chemistry for Better Drug Analysis

Stability Indicating RP-HPLC Method for the Determination of Luliconazole in Pharmaceutical Formulation (Gel)

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Abstract: Luliconazole is a wide spectrum antifungal agent and is very potent against dermatophytes with a unique structure, as the imidazole moiety is incorporated into the ketene dithioacetate structure. Luliconazole is the *R*-enantiomer, and has been found to be more potent than its racemic mixture, Lanoconazole. A simple, accurate, specific, precise, robust, rapid and selective stability indicating high performance liquid chromatography (HPLC) method was developed for the assay of Luliconazole in bulk and gel based formulation. The HPLC separation was achieved on kromasil C18 (100mm × 4.6mm, 5 µm) column using a mobile phase of ACN: water (70:30, v/v) adjusted the pH 3 with 0.1% orthophosphoric acid at a flow rate of 1 mL · min^{-1}and UV detection at 295 nm. Peak elutes at 6.15 min appropriate. The method was validated for linearity, repeatability, accuracy, precision, robustness, limit of detection and limit of quantification. The accuracy was between 99.2 -99.6%. The highest R.S.D. amongst interday and intraday precision were found to be 0.24 and 0.17 respectively. The assay was linear over the concentration range of 10-50 µg/ml (R^{2-} 0.999). LOD and LOQ were found to be 0.099 and 0.3005 respectively. Stress testing was carried out in presence of acid, base, hydrogen peroxide, heat and light to demonstrate speci? city of the method as per ICH guidelines. The developed method could separate the potential degradation products from the Luliconazole peak. It was concluded that highest degradation occurred in basic condition. This proposed method was suitable and practical for analyzing the content of Luliconazole in pharmaceutical products and could be of bene? t for the prediction shelf life of Luliconazole in gel based formulations.

Keywords: Luliconazole; Liquid Chromatography; Assay; Development; Validation.

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Evaluation of antioxidant potential and quantitative analysis of Key flavonoids and bioactive compound by RP-HPLC and HPTLC in the leaves of *Vitex agnus castus*

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Abstract

Vitex agnus-castus L., of the Verbenaceae family is mentioned in ancient medicinal art as an official medicinal plant. It is used traditionally to treat premenstrual syndrome, inflammatory disorders such as pain of rheumatism etc so the objective is to evaluat the *in-vitro* and *in-vivo* antioxidant activities of its various extract of leaves part and elucidate possible mechanism(s) with the quantification of bioactive compounds by RP-HPLC and HPTLC. Petroleum ether, ethyl acetate, methanolic and aqueous extract of the leaves of *Vitex agnus castus* L were prepared and assessed for *in vitro* antioxidant activity by various in vitro assay models. The extracts were also evaluated for *in-vivo* antioxidant activity by estimating level of Glutathione, SOD., Catalase and Lipid peroxidase and identification and quantification of major bioactive compounds by RP-HPLC and HPTLC were done. Methanolic extract found to be having more in vitro and in vivo antioxidant activity. Further, the quantification of constituents present in the extract was carried out by RP- HPLC and HPTLC which has shown kaempferol (0.24%), Luteolin (0.12%) and Aucubin (0.43625 µg) in the methanolic extract.The significant antioxidant activity which may be due to the presence of polyphenolics and flavones in the vitex.. The antioxidant property makes it suitable for chronic and prolonged administration required for treatment of chronic inflammatory process.

Keywords: Anti–lipid peroxidation, antioxidant activity, DPPH, flavonoids, phenolic contents, Vitex agnus castus.

INTRODUCTION

Oxygen is present in the atmosphere as a stable triplet biradical ($^3O_2$) in the ground state and a vital component for the survival of the human.Once inhaled, it undergoes a gradual reduction process and ultimately gets metabolized into water.In this process,a small amount of reactive intermediates,such as super oxide anion radicals (O_2^-), hydroxyl radicals (OH^-), nonfree radical species (such as H_2O_2), and the single oxygen ($^1O_2$) are formed[1]. Those reactive intermediates are collectively termed as reactive oxygen species (ROS). [2,3]These primary derivatives of oxygen play an important role in mediating ROS-related effects. [4] ROS can easily initiate the peroxidation of the membrane lipids, leading to the accumulation of lipid peroxides.The peroxidation products by themselves and their secondary oxidation products, such as malondialdehyde (MDA) and 4-hydroxinonenal (4-HNE) are highly reactive; they react with biological substrates, such as protein, amines, and deoxyribonucleic acid (DNA).[5] In living organisms various ROS can be formed by different ways.In normal aerobic respiration, stimulated polymorph nuclear leukocytes and macrophages and peroxisomes appear to be the main endogenous sources of most of the oxidants produced by cells.Exogenous sources of free radicals include tobacco smoke, ionizing radiation, certain pollutants, organic solvents and pesticides [6]. Most living species have an efficient defense systems to protect themselves against the oxidative stress induced by ROS. Recent investigations have shown that the antioxidant properties of plants could be correlated with oxidative stress defense and different human diseases including cancer, atherosclerosis and the aging processes. [7] Antioxidants can interfere with the oxidation process by reacting with free radicals, chelating free catalytic metals and also by acting as oxygen scavengers. Phenolic antioxidants functions are free radical terminators and sometimes also metal chelators[8]. Thus, antioxidant defense systems have co-evolved with aerobic metabolism to counteract oxidative damage from ROS. The antioxidants may be used to preserve food quality from oxidative deterioration of lipid. Therefore,antioxidants play a very important role in the food industry. Synthetic antioxidants, such as butylated hydroxyanisole (BHA), butylated hydroxytoluene (BHT) and *tert*-butylhydroquinone (TBHQ) are widely used in the food industry, but BHA and BHT have suspected of being responsible for liver damage and carcinogenesis. Therefore, the development and utilization of more effective antioxidants of natural origin are desired.

Vitex agnus castus was already in ancient medicinal art as an official medicinal plant and is named in the work of Hippocrates, Dioskurides, Theophrastus and others[9] In clinical trials, the fruit agni castus fructus was shown to relieve premenstrual syndrome (PMS) including corpus luteum insufficiency, premenstrual syndrome (PMS),menopausal symptoms and insufficient milk production and especially breast swelling and pain due to its dopaminergic effect. [10,11,12] It has been reported that *Vitex agnus castus* contains iridoids, flavonoids,diterpenoids, progestins, essential oils and ketosteroids. [13,14] Considering the traditional uses of this Ayurvedic drug, the preliminary phytochemical studies, and total polyphenolic determination, it was predicted to have antioxidant activity. In this study, we wanted to determine the antioxidant effects of *Vitex agnus castus* and compare their antioxidant activities with those commonly used as natural antioxidants such as ascorbic acid and synthetic antioxidants such as BHA and BHT. The aim of this study was to investigate the antioxidant properties of *Vitex agnus castus* in order to evaluate its medicinal value and to point an easily accessible source of natural

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RESEARCH ARTICLE

FORMULATION AND EVALUATION OF ONCE A DAY DUAL COMPONENT GASTRO RETENTIVE DRUG DELIVERY SYSTEM

***Vinchurkar Kuldeep, Mane Sheetal, Sainy Jitendra and Khan Masheer**

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ABSTRACT

There is about 15-30 % incidence of co-existence of hypertension and hypercholesterolemia in India. This has more than additive adverse impact on vascular endothelium which leads to cardiovascular diseases. Hypertension and hypercholesterolemia are major risk factors in pathogenesis of coronary heart disease. Due to this, the patients may require concomitant treatment with antihypertensive and hypo-lipidemic agents. The combination of antihypertensive (beta blocker) and antihyperlipidemic (statin) drugs are reported to reduce cardiovascular events and progression of dyslipidemic hypertension. The purpose of this study was to prepare a bilayer gastro retentive tablet of Metoprolol succinate and rosuvastatin calcium using direct compression technology and optimize the type and concentration of polymer and superdisintegrant to give good drug release profile in patient having hypertension with hypercholesterolemia. Rosuvastatin is a competitive inhibitor of HMG co-reductase, has half-life of 19 h and bioavailability 20 % favors immediate release while Metoprolol succinate is a $_1$-selective adrenergic receptor blocking agent and numbers of clinical trials have demonstrated the beneficial effects of Metoprolol therapy in heart failure, with decreased mortality due to both reduction in sudden death and death from worsening heart failure and it has half-life of 3 to 4 hours, and high stability and higher absorption window in acidic environment of stomach, favors development of sustained release floating formulation. The current investigation aims at development of safe, stable and efficacious dual component (bilayer) floating tablet formulation with differential release profiles of antihypertensive drug candidate (sustained release) and antilipidemic drug candidate (as fast release) component. A bilayer tablet was prepared in which, HPMC K100, K4M, K15M were used as gel forming agents while cross carmellose sodium, sodium starch glycolate and cross povidone alone used as a superdisintegrant. A sodium bicarbonate used as effervescent agent. The bilayer tablets were characterized by lag time, floating time, weight variation, drug content, dissolution profile and stability study. Best formulation F9, release 99.48% of Rosuvastatin calcium after 30 min and 96.6% of Metoprolol succinate after 12 hrs to achieve local therapy in the stomach, site-specific drug delivery reduces undesirable effects of side effects, reduced frequency of dosing with improved patient compliance and significant increase in bioavailability

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INTRODUCTION

Globally, cardiovascular diseases are the number one cause of death and they are projected to remain so (Kishor, 2007). If current trends are allowed to continue, by 2030 an estimated 23.6 million people will die from cardiovascular disease. Hypertension is the primary cause of stroke, major risk factor for coronary artery disease like atherosclerosis and its complications and it is a major contributor to cardiac failure, renal insufficiency and high blood pressure is also called "the silent killer" because it often causes no symptoms for many years, even decades, until it finally damages certain critical organs. Hypercholesterolemia refers to elevated levels of lipids and cholesterol in the blood, and is also identified as dyslipidemia, to describe the manifestations of different disorders of lipoprotein metabolism (Cardiovascular disease and risk management, 2019). Hypertension and hypercholesterolemia are the major contributing factor to coronary heart disease. The prevalence of co-existence of hypertension with hypercholesterolemia is 15-30% in India which has more than an additive adverse impact on vascular endothelium which leads to cardiovascular diseases (Golomb, 2008; Yilmaz, 2018). Hypertension and hypercholesterolemia frequently coexist and may require concomitant drug treatment

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Pharmacognostical And Phytochemical Evaluation of *Plumeria Obtusa*(Linn.) Leaves

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Abstract

The quality management of the crude medication and their formulations is of great importance in acceptance of their acceptableness in present system of drugs that's why the topic of herbal drug standardization is massively wide and deep. This can be achieved only if the herbal products are evaluated and analyzed using various techniques of standardization. Plumeria Obtusa which is a herbal medicinal plant and is used in treatment of hyper proliferative tissue with gastroprotective activity, Anti-mutagenic activity and Anti-bacterial activity. This study reports on the standardization of Plumeria obtusa based on organoleptic characters, physical and physio-chemical properties. The crude drug has been evaluated on the basis of the following parameter that includes the morphology, qualitative as well as quantitative microscopy and physio-chemical characteristic studies of the plant (leaves). As a very limited research has been carried out on the plant, under the present study assumes singular significance and it is supposed to contribute a great deal to the existing literature. These observations would even be of huge price within the ayurvedic and herbal identification and standardization of the drug in crude type conjointly this study would facilitate differentiation of the drug from its other species.

Keywords: *Gastro protective activity, Anti-mutagenic activity Anti-bacterial activity, physio-chemical*

I. Introduction

Medicinal herbs which we have been using since ancient times, many of these, are used as herbal remedies. The use of herbal medicine has been encouraged due to toxicity and side effects of allopathic medicines.

Acoording to WHO herbal medicines as medicinal product that contain active ingredients, aerial or underground parts of the plant. In the last few years there we have been noticing a tremendous growth in the field of herbal medicine. It has become popular in developing as well as in developed countries owing to its natural origin and lesser side effect [1].

As per the WHO the process of the physicochemical evaluation of crude drug includes the aspects, as selection and procurement of crude material, safety, and stability checking of final product, and maintaining the records for the safety purpose as well as to provide the product information to consumer and product promotion. The Pharmacognostical

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Eradication of Pediatric HIV-1 Infection: A Review on Progress and Challenges

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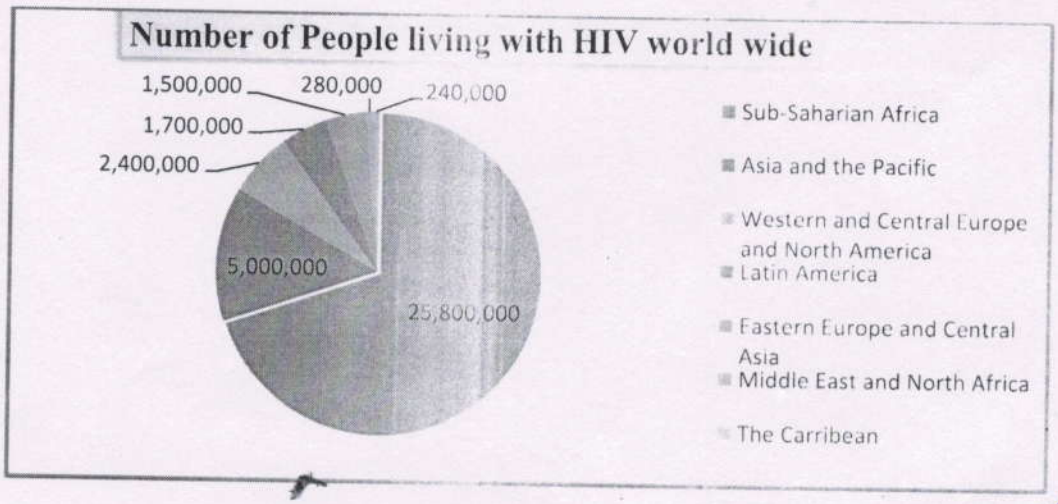
Abstract

Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome has a tremendous impact on society as well as also has large economic impacts. HIV infection by mother to child transference is increasing in the world because of the increase in infected mother that she has not receiving appropriate antiretroviral therapy. There are several barriers to efficient management like delayed infant diagnosis, lack of appropriate pediatric dosage form, inadequate skilled health professionals, etc. Underdeveloped immunity allows large spreading throughout various organs of the body. There is an increased rate of occurrence of lack of proper nutrition and infections that may be more tenacious, severe and less responsive to treatment. Early diagnosis and therapy are required to prevent the development of AIDS. New therapies are also becoming available but absolute prevention of infection, through maternal therapy during pregnancy, is the most fruitful measure in preventing this infection. During pregnancy, labor and delivery successfully reduces intrauterine and intrapartum HIV-1 transmission by the use of antiretroviral drugs.

Key Words: HIV/AIDS, mother to child transference, antiretroviral therapy, pediatric dosage form etc.

1. INTRODUCTION:

The crowd of Human Immunodeficiency Virus infected people is tremendously increasing worldwide (Steinbrook, 2004). In 2014 about 3.69 million people were living with HIV (containing 2.6 million children) – a global HIV prevalence of 0.8 %(UNAIDS, 2015). Above 90% of HIV-infected children got the infection from their mother, either before or around the time of birth and about 230,000 children die.



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ADDICTING DRUG–NEURAL SYSTEM, PREVENTION AND GOVERNMENT POLICIES: A REVIEW

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ABSTRACT

Addiction is a global phenomenon having a negative impact on every aspect of user's life, physical health, social and family life, occupation, finances, etc. Addiction is not only about Cocaine, Heroin, not also about Alcohol, Smoking and Tobacco but also about addiction of general things like medicine, inhalation of some cosmetics as well as pain reliving gels, ointments, cream, pastes, etc. Addiction of drugs and general things has its vast impact in various regions. Different government of different countries has conducted various surveys. One of the survey conducted in Chandigarh, India has claimed that 93.06% of total people are dependent on alcohol. Governments of some countries are running various policies and programs to tackle this problem like training programs, labor development programs and rehabilitation centers etc. The Narcotics and Psychotropic Substances Act, 1985, commonly referred to as NDPS Act, is an act of parliament of India that prohibit a person to produce/manufacture/cultivate, possess, sell, purchase, transport, store and consume any narcotic drug or psychotropic substances.

KEYWORDS: Addiction, Neural System, Drug Action, Central Nervous System, Narcotics.

INTRODUCTION

Addiction is a physical or psychological need to do, take air use something to the point where it could be harmful to you.

Neural system or nervous system is the system that coordinates its actions by transmitting signals to and from different part of the body.

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Pharmacosomes: A new class of drug carrier delivery: A review

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Abstract
Pharmacosomes are ampipathic lipid vesicular systems that are of very great importance because they are known to improve the bio-availability of lipid insoluble drugs. They are the colloidal dispersions of drugs which are covalently bounded to lipids, and exist as ultrafine vesicular, micellar, or hexagonal aggregates, depending on the chemical structure of drug-lipid complex. Because the system is formed by linking a drug (pharmakon) and carrier (soma) hence they are called pharmacosomes. The pharmacosomes show greater stability, facilitated transport across the biological membrane and a controlled release. Pharmacosomes have been prepared containing various non-steroidal anti-inflammatory drugs, proteins, cardiovascular and antineoplastic drugs. Development of pharmacosomes containing different drugs has been found to improve the absorption and minimize the gastrointestinal toxicity. Pharmacosomes are like the solution for all most all the problems which are related with liposomes, niosomes, transferosomes and so forth. They may serve as efficient tool to achieve desired therapeutic action by drug targeting and controlled release.

Keywords: pharmacosomes, vesicular, phospholipid complexes, bioavailability, targeted drug delivery system

Introduction

The most acceptable system is the Novel drug delivery system and approachable in developing the drug delivery system which improves the therapeutic efficacy of drugs thus provides controlled and sustained drug delivery to the specific site with minimum side effects. Many systems including liposome, noisome, virosomes, and transferosomes have demonstrated their potential for application in effective drug delivery. The limitations of transfersomes can be overcome by the "Pharmacosome" approach. The prodrug unites the hydrophilic and lipophilic properties, and for this reason it acquires amphiphipathic characters. Likewise to other components which are helpful in different vesicle systems, it was found to greatly reduce interfacial tension in fact at higher concentrations it exhibits very powerful mesomorphic behavior. Pharmacosomes are amphiphathic complexes of drugs (containing an active H atom) with lipids. The drugs may be bound covalently, electrostatically or by hydrogen bonds to lipids. Depending on the chemical structure of the drug-lipid complex, they are defined as colloidal dispersions of drug covalently bound to lipids existing as ultrafine vesicular, micelle, or hexagonal aggregates. Controlled drug-delivery system is genrally made to achieve two main targets they should be possessing: the ability to reach its target and the ability to release the active pharmaceutical ingredient in a very controlled manner. Any drug containing an active hydrogen atom like (COOH, -OH, -NH2, etc.) can be esterifies to the lipid, with or without spacer group that strongly result in an amphipathic compound, which will facilitate membrane, cell wall or tissue transfer, in the organism. The system yet requires greater efforts towards investigating the non-bilayer phases, and exploring the mechanism of action [1, 2].

Merits

- It is suitable for both water soluble and lipid soluble drugs.
- The aqueous ampiphllic solutions exhibit a concentration dependent accrument.
- High and predetermined entrapment efficiency as drug and carrier form a stoichiometrically defined unit covalently linked together.
- Entrapment efficiency is not going to be influenced by its inclusion volume.
- Like in the the case of liposomes, here there will be no need to remove free and unentrapped drug.
- As drug is covalently bound, membrane fluidity has no effect on release rate, but in turn depends upon the phase-transition temperature of the drug-lipid complex.
- As here the drug is covalently binded to carrier therefore no leakage of drug will take place and drug can also be deliverd directly to its site of action
- Drug present in pharmacosomes is genrally released from pharmacosomes by hydrolysis (including enzymatic). Their velocity of degradation into the metabolite and its active drug molecule, after absorption depends on the size, functional groups present in drug molecule, the chain length of the lipids, and the spacer group.
- Helpful in improving bioavailability in the case of poorly soluble drugs.
- Adverse effects and toxicity can be minimized.

Demerits of Pharmacosomes

- Amphiphilic nature will depend upon the compound synthesis

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A New Class of Probiotic Health Drink –Kombucha

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Keywords:
Kombucha , traditional sweet beverage , symbiotic colony of bacteria and yeast (SCOBY).

ABSTRACT

Kombucha is a traditional sweet beverage containing potential hepatoprotective agents prepared by fermenting sweetened black or green tea with a symbiotic colony of bacteria and yeast (SCOBY). It is consumed, but historically in China, Russia and Germany for its refreshing and beneficial properties on human health. Drinking of kombucha can prevent various types of human illness including AIDS, cancer, cardiovascular diseases, and diabetes and stimulate the immune system. Kombucha is the "ultimate health drink". Potential health effects have created an increased interest in kombucha. Adverse effects are very rare, which possibly arise from contamination during home preparation. In present review the beneficial effects of Kombucha on human health were studied, its production and adverse effects associated with drinking of Kombucha were explored.

Introduction

Kombocha is a slightly sweet, acidic refreshing beverage, which is eaten worldwide.It is mainly produced by fermenting tea using symbiotic colony of bacteria and yeast (SCOBY). It tastes like apple cider. It was first used in East Asia for its healing benefits, but mainly it originated in northeast China around 220B.C. It is known by 80 different names worldwide. [1] In Japanese the term Kombucha refers to different beverage made from dried and powdered Kombu. Advantages of Kombucha Antimicrobial action: - It shows inhibitory action against various pathogenic

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HYBRID SPERM-MICROMOTORS FOR TARGETED DRUG DELIVERY

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Introduction

Nanomaterials have ushered a new era in the field of therapeutics, and now treatment for complex disorders that was rendered impossible with conventional approach seems possible. This is exemplary with the invention of magnetic nanobeads that contain a core of magnetic material and coating of functional chemical component that is directed using the magnetic core, quantum dots which are used in medical imaging, upconverting nanomaterials that work on the principal of photon emission after absorption of multiple low energy photon and are used in development of biosensors and targeted drug delivery in cancer, hydrogel sheets used in dressing of wounds, and gold nanoparticles that are used as sensory probes, therapeutic agents and drug delivery. These approaches when applied to the field of reproductive health have also made the field buzzing with new therapeutic approaches [1, 2].

One such approach is the use of Micro- and nano-motors a

play a significant role in human and animal reproduction as well. Nanotechnology in reproduction is a novel area in biological science, showing promising results in the field of microfluidics, microencapsulation, bioimaging, drug delivery and biosensor. This branch of science has a high potential to benefit various sectors such as human, animal health and agriculture. But with any new technology, the moral ethical responsibility comes to use the technology wisely and recognize potential unforeseen risks that may jeopardize its positive potential.

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NANOMEDICINE SET TO EMPOWER THE NOVEL THERAPEUTICS OF PREECLAMPSIA

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Abstract

Preeclampsia is a serious complication of pregnancy. It involves sudden onset of high blood pressure that cannot be controlled, and it is also associated with a widespread maternal and fetal morbidity. There is continuous enrichment in the understanding of the disease like involvement of nitric oxide, chronic inflammation, altered autophagy and more recent reports indicating a role of soluble fms-like tyrosine kinase-1(sFlt-1), which has antiangiogenic properties and placental growth factor. However, preeclampsia treatment has still a long way to go and delivery of the baby and the placenta are the only viable alternatives available. In this article,the current advances in pathophysiology mechanism of preeclamsia are discussed along with the current updates in preeclampsia treatment witha focus on application of nanocarriers based approaches in the management of preeclampsia. In conclusion, it can be contemplated that nanomedicine approaches could be helpful in preventing transplacental passage of drugs and might be helpful in targeting the human placenta. This approach will not only ensure safety of both fetus and mother but will also improve the efficacy of existing therapy. With a positive outcome in the ongoing clinical research, nanomedicine may pave a way to treat pregnancy complications like preeclampsia and mitigate the emergency caesarean sections.

Introduction

According to WHO reports preeclampsia is a hypertensive complication of pregnancy and results in 3–4% of pregnancy associated morbidity. Preeclampsia is reportedly one of the major causes of prematurity as it is treated by inducing labor or performing emergency caesarean sections. This therapeutic approach is adopted as there are several constraints for investigations of new approaches in pregnancy. Thus, treatment for preeclampsia is long overdue and requires all round efforts to ensure safe pregnancy [1].

Nanomedicine refers to use of particles in the size range of nanometers as medicines, and 'nanocarrier' refers to any particle with dimension of 1–100 nm used in a formulation to carry the drug of interest to the targeted tissue. Use of nanocarriers helps in altering the biodistribution of a candidate drug thereby increasing their efficacy and safety [2]. This strategy is promising especially in pregnancy as it may help avoid all the possible side effects of drug to fetus including teratogenicity. In this article, the pathophysiology of preeclampsia is detailed along with the discussion of recently explored therapeutic targets and studies on nanomedicines/nanocarriers for treatment of preeclampsia [3].

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Evaluation of Polyherbal Anticancer Tablets: A Review

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Abstract: Cancer is a malignant abnormal growth of cells, one of the most dreaded and complex diseases. It concerns with several tempo spatial changes in cell composition, which finally lead to neoplasia. Various types of cancers have been reported. Chemotherapy, radiation, and/or surgery may cure them. Herbal remedies are supposed to be harmless as they cause fewer complications and are less likely to habitual. Antioxidant compositions of therapeutic plants show the anticancer activity and therefore, use of different proportions of the active components to formulate various standardized preparation with single or multiple components for their synergistic effects play a crucial role in curing cancer. Evaluation parameters to assess the *in vitro* anticancer activity includes Caspase-3, Caspase-9, alamar blue, LDH assay, XTT assay, sulforhodamine-B assay, MTT assay, DNA fragmentation assay, neutral red uptake cytotoxic assay, tryphan blue assay. Evaluation of dried extract or granules includes bulk density, tapped density, Carr's index, Hausner's ratio, angle of repose while the tablets evaluated by drug-excipient compatibility study by FT-IR, stability studies, hardness, thickness, weight variation, friability, disintegration time and dissolution test.

1. INTRODUCTION

Malignancy persists to distinguish the leading cause of death in the human race and claims greater than 6 million lives per year (Abdullaev, 2001). An extremely potential approach to prevent cancer is chemotherapy, which is characterized as the utilization of synthetic or natural agents used alone

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Medicinal Value of Apricot: A Review

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Development of Rapid and Sensitive Reverse Phase High Performance Liquid Chromatography Method for Estimation of Ketorolac Tromethamine in Proniosomal Gel

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Imminent composition of *Musa paradisiaca* Blossom of Indian origin: A review

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Abstract
Musa paradisiaca species of banana is majorly grown in India. It contains high amount of fibre which has very high nutritional value. It contain plethora of phytoconstituents as alkaloids, glycosides, terpenoids, saponins, steroids, vitamins in it. The flowers of banana blossom are of tremendous nutritional importance as it contains (moisture, ash, fiber, protein and carbohydrate). As per the different elementary studies, it also contains some macro (Ca, K, Cl, S) and micro (Mn, Zn, Cu) elements and contains vitamin E and high amount of flavanoids. The extracts of blossom with ethanol and water are mainly used due to its antinflammatory activity, antimicrobial activity, antioxidant activity, pancreatic lipase inhibitory activity and contain a number of flavonoids, vitamin E in it.

Keywords: *Musa paradisiaca*, macro and micro elements, anti-inflammatory, vitamin E

Introduction

It is of tremendous importance in traditional medicine in the treatment of bronchitis, constipation, ulcer problems and menstrual bleeding [1, 13]. The extracts of banana blossom have antioxidant properties that prevent free radicals and control cell and tissue damage [2]. It is used as a vegetable in a variety of Medicinal plants with significant pharmacological importance are used to treat different diseases as it is mentioned in many cultures and various system of medicine. This endemic knowledge, is transferred from generations. This review focuses on the species of banana blossom which is widely grown in India, its imminent composition and its uses infact different pharmacological studies were carried out to validate the traditional uses of M. paradisiaca which is used to prevent and cure different types of disease and used as food and vegetable [14, 15]. The banana blossom is a large, dark purple-red blossom grows at the end of a bunch of bananas as shown in fig 1 [3]. The banana plant starts to spread in India by about 600 BC and after that it starts spreading all over the tropical world. It is considered as worlds oldest cultivated crop. One of such plant family which is of medicinal importance is Musaceae. It consists of 2 genera and has 42 different species and in that 42 species, 32 species belongs to musa species it is one of the largest known herbaceous flowering plant in the world [4]. Banana and superannuated fruit known as "Apple of the Paradise". India is considered as world's largest producer of banana and it is grown almost in every state [5]. Banana blossom is having tremendous nutritional value and has various health benefits. The flower raw form and sometimes it is consumed in cooked form by some Asians. The nutritional properties and health benefits of banana blossom are less focused by researchers, taking note on all these factors the present study was done to analyze the nutritional composition and antioxidant properties.

Fig 1: The banana blossom is a large, dark purple-red blossom grows at the end of a bunch of bananas

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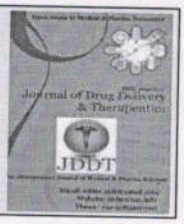

Open Access

Review Article

Antioxidants: a brief review

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ABSTRACT

The field of free radical chemistry has gained a great deal of attention in recent years. Free radicals reactive oxygen species generated by our body by various endogenous systems leads to various pathological conditions. A balance between free radicals and antioxidants is prerequisite for proper physiological function. Oxidative stress caused by generation of free radicals adversely alters lipids, proteins, and DNA and provokes a number of human ailments. Oxidative stress can be managed by using external sources of antioxidants. Synthetic antioxidants such as butylated hydroxytoluene and butylated hydroxyanisole have recently been reported to be harmful for human health. Thus, the search for effective, nontoxic natural compounds with antioxidant activity has been escalated in recent years. The present review provides a brief overview on antioxidants and natural sources of antioxidants in the management of human diseases.

Keywords: free radical, Oxidative stress, antioxidants,

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INTRODUCTION

An antioxidant is a molecule that prevents the consumption of oxygen. It is capable of repressing or slowing the oxidation of other molecules. Oxidation is a chemical reaction that transfers electron from a substance to an oxidizing agent[1]. These chemical reactions can produce free radicals and these radicals are capable of initiating wide variety of toxic oxidative reactions such as peroxidation of membrane lipids, direct inhibition of mitochondrial respiratory chain enzymes, fragmentation or random cross linking of molecules like DNA, enzymes and proteins and can commence different degenerative diseases like neurological disorders, cancer, emphysema, cirrhosis, atherosclerosis, arthritis etc [2,3].

Free radicals have an unpaired electron that causes them to seek out and capture electrons from other substances in order to neutralize themselves. Although the initial attack causes the free radical to become neutralized, another free radical is generated in the process, causing a chain reaction to initiate. And until subsequent free radicals are deactivated, thousands of free radical reactions can occur within seconds of the initial reaction. Antioxidants play an important role in deactivating the free radicals before they attack cells[1].

Reactive Oxygen Species

Reactive oxygen species (ROS) are described as highly reactive, oxygen containing molecules, including free radicals. They are generated as a by-product of cellular metabolic pathways and play an important role as a critical second messenger in a variety of intracellular signaling pathways. Defect in the anti-oxidant defense system and excessive intracellular generation of ROS resulting in oxidative stress[4]. Different types of ROS produced in cells include the hydroxyl radical, the superoxide anion radical, hydrogen peroxide, singlet oxygen, nitric oxide radical, hypochlorite radical, and various lipid peroxides[1,5]. The common feature for all ROS is their capability of reacting with membrane lipids, nucleic acids, proteins and enzymes, and other small molecules, resulting in cellular damage[1].

Protection

It is well documented that antioxidants terminate chain reactions by removing free radical intermediates, and inhibit other oxidation reactions. ROS formation has been reported to be a significant step leading various age related neurodegenerative disorders such as Alzheimer's disease and Parkinson's disease[6]. ROS including superoxide radicals, hydroxyl radicals, singlet oxygen and hydrogen peroxide are often generated as byproducts of biological reaction or from exogenous factors. However, these ROS produced by sunlight, ultraviolet light, ionizing radiation, chemical reactions and metabolic processes have various pathological effects such as DNA damage, carcinogenesis and various degenerative disorders such as cardiovascular diseases, aging and neuro-degenerative diseases[7].

Naturally produced antioxidant such as ascorbic acid, vitamin E and phenolic compounds, posses the ability to reduce the oxidative damage associated with many diseases, including cancer, cardiovascular diseases, cataracts, atherosclerosis, diabetes, arthritis, immune deficiency disease and ageing. Antioxidant compounds may act as free radical scavengers, complexes of pro-oxidant

Development of Proniosomal Gel: *in-vitro, ex-vivo and in-vivo* Characterization

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ABSTRACT

The **aim** of the present research work was to characterize the *ex-vivo, in-vitro* and *in-vivo* studies of proniosomal (PN) gel of ketorolac tromethamine (KT). **Experimental work:** Proniosomal suspension was prepared by rotatory flask evaporator with addition of nonionic surfactant (Sodium Cholate) at concentration ranges (3%, 2% and 1%). Co-solvent like isopropanol, butanol and ethanol as well as dimethyl sulphoxide (DMSO), was later added which act as permeability enhancers in gel formulations. Carbopol 940 was added as the gelling agent in proniosomal suspension. **Characterization:** PN gel acts as percutaneous enhancers on the transdermal permeability hence were investigated for *ex-vivo* (Franz Diffusion Cell), *in-vitro* (Membrane Diffusion Technique) *and in-vivo* (Estimation of KT in serum at different time intervals by RP-HPLC) studies. Effect of KT on acute inflammation was evaluated in rat carrageenan-induced edema model. **Results:** Proniosomal gel formulation F1 consisting of sodium cholate, isopropanol and soya lecithin, showed highest drug release of 94.048 % in 24 hrs and formulation F9 showed lowest drug release of 73.789 % in 16 hrs. Transdermal flux (J) of formulation F1 was found to be high ($7.518 \pm 0.041 \mu g/cm^2.hr$) as compared to other formulations and marketed preparation. Proniosomal formulation (F1), consisting of sodium cholate (concentration 3%) and cosolvent (isopropanol) attained highest penetrability effect, where sodium cholate and isopropanol induced significant changes in membrane permeability as they completely solubilised membrane phospholipids by sodium cholate micelles. In case of F1 formulation, percent inhibition was found to be 66.84%. Serum estimation of Ketorolac Tromethamine (KT) revealed that application of F1formulation produced 4-fold increase in peak plasma concentration within 12 hours and was maintained upto 24 hours as compared to marketed formulation. Eventually a significant *in-vitro-in-vivo* correlation was achieved and PN formulation of KT shows significant improvement in bioavailability of KT in systemic circulation when applied via topical route as compared to marketed gel preparation.

Key words: Ketorolac Tromethamine, Carbopol 940, Proniosomal Gel, Permeability, inflammation.

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INTRODUCTION

Transdermal delivery of medicaments via skin to the systemic circulation provides suitable route of administration for a variety of drug moiety.

For permeation of drug during transdermal delivery, stratum corneum is the most important layer, which act like as barrier. Various approaches are used of penetration enhancement used to increase the flux through skin membrane.[1,2] Transdermal drug delivery offers controlled release of the drug; it enables a steady blood level profile, resulting in reduced systemic side effects and patients compliances.[3,4] Transdermal drug delivery systems using vesicles based formulation facilitated colloidal particulate carriers such as niosomes or

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Research Article

DEVELOPMENT AND EVALUATION OF PRONIOSOMES AS DRUG CARRIERS FOR TRANSDERMAL DELIVERY OF KETOROLAC TROMETHAMINE

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ABSTRACT

Ketorolac tromethamine is a drug with narrow therapeutic index and short biological half-life. This study was aimed at developing and optimizing proniosomal formulation of ketorolac tromethamine in order to improve its bioavailability. The prepared proniosomal gel formulations were evaluated and the effect of the varying composition of non ionic surfactant and cholesterol in various formulations were studied, such as vesicle shape, zeta potential, entrapment efficiency, and *in- vitro* drug release study. The presence of cholesterol made the proniosomes more stable with high drug entrapment efficiency and retention properties. The highest entrapment efficiency was observed with sodium cholate 88.17 ± 0.95 as compared to those formulation prepared with span60 and with sodium deoxycholate. Formulation F1 (LCI-I), zeta potential value was observed -20.0 mV, which is a measure of net charge of proniosomes which made them stable, by preventing aggregation. Formulation F1 which prepared by sodium cholate, showed highest drug release of 94.048 % after 24 hrs as compared to formulation F6 (LDCI-3) and F9 (LSI-3) which were prepared by sodium deoxycholate and sapn60 showed lowest drug release of 76.35% and 69.12%.

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INTRODUCTION:

Development of a new drug molecule is expensive and time consuming. Improving safety efficacy ratio of "old" drugs has been attempted using therapeutic drug monitoring (TDM) of formulation based on novel drug delivery systems. Proniosomes are based on dry formulation of water soluble carriers that are coated with surfactant. It forms niosomal dispersion immediately during the rehydration to before use on agitation in hot aqueous media within minutes[1]. Proniosomes are physically stable during the storage and transport. Drug encapsulated in the vesicular structure of proniosomes prolong the existence of drug in the systematic circulation and enhances the penetration into target tissue and reduce toxicity. Due to the limited amount of water present, these systems behave as viscous phases. When compared with conventional formulations, generally show a better control of blood levels, a reduced incidence of systemic toxicity, no hepatic first-pass metabolism and a higher compliance [2,3]. These 'proniosomes' minimize problems associated with niosome base formulation such as physical stability like aggregation, fusion and leaking, and provide additional convenience in transportation, distribution, storage, and dosing. The focus of this research work is to bring out different aspects related to proniosomes preparation, characterization, entrapment efficiency, *in vitro* drug release and *in vitro* permeation studies.

METHOD OF PREPARATION:

The proniosomes were prepared by rotatory flask method by dissolving cholesterol and various types of surfactants (span60, sodium deoxycholate and sodium cholate) in different concentration in alcohol and thin film was formed along the sides of the flask by continuous vortexing. Drug was dissolved in 10ml of phosphate buffer saline (PBS) pH.7.4 and added to the thin film and then sonicated for 5 min. The proniosomal suspensions were formed, and then these suspensions kept at 4°C.

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The Latest Methods and Technologies of Pulsatile Drug Delivery System: A Review

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Abstract

Pulsatile drug delivery systems (PDDS) have multiple benefits over conventional dosage forms , drugs are released in an immediate or extended manner. A pulsatile drug release, where the drug is released rapidly after a well defined lag-time, could be advantageous for many drugs or therapies. They deliver the drug at the right time, at the right site of action and in the right amount, which provides more benefit than conventional dosages and increased patient compliance. These systems are designed according to the circadian rhythm of the body and the drug is released as a pulse. Diseases like asthma, peptic ulcers, cardiovascular ailments, arthritis and attention deficit syndrome in children and hypercholesterolemia can be cured by drugs, released by PDDS. This review covers methods and marketed technologies that have been developed to achieve pulsatile delivery. Marketed technologies, such as Pulsincap™, Diffucaps®, CODAS®, OROS® and PULSYS™, follow the above mechanism to render a sigmoidal drug release profile. Diseases wherein PDDS are promising include asthma, peptic ulcers, cardiovascular ailments, arthritis and attention deficit syndrome in children and hypercholesterolemia. Pulsatile drug delivery systems have the potential to bring new dents in the therapy of many diseases.

Key words: Pulsatile, Chronotherepy, Lag-time.

Introduction

Oral controlled drug delivery systems represent the most popular form of controlled drug delivery systems for the obvious advantages of oral route of drug administration. Such systems release the drug with constant or variable release rates[4]. These dosage forms offer many advantages, such as nearly constant drug level at the site of action, prevention of peak-valley fluctuations, reduction in dose of drug, reduced dosage frequency, avoidance of side effects, and improved patient compliance. [5,7]

However, there are certain conditions for which such a release pattern is not suitable. These conditions demand release of drug after a lag time. In other words, it is required that the drug should not be released at all during the initial phase of dosage form administration.[2] Such a release pattern is known as pulsatile release's pulsatile drug delivery system is characterized by a lag time that is an interval of no drug release followed by rapid drug release.[10]

The principle rationale for the use of pulsatile release is for the drugs where a constant drug release, i.e., a zero-order release is not desired.[5]

In chronopharmacotherapy drug administration is synchronized with biological rhythms to produce maximal therapeutic effect & minimum harm for the patient. Technically, pulsatile drug delivery systems administered via the oral route could be divided into two distinct types, the time controlled delivery systems and the site-specific delivery systems, thus providing special and temporal delivery. In recent Pharmaceutical applications involving pulsatile delivery; multiparticulate dosage forms (e.g. pellets) are gaining much favor over single-unit dosage forms. Designing of proper pulsatile drug delivery will enhance the patient compliance, optimum drug delivery to the target side & minimizing the undesired effects.[9]

The shift from conventional sustained release approach to modern pulsatile delivery of drugs can be credited to the following reason(s):[4,7,9,12]

1. **First pass metabolism**

Some drugs, such as beta blockers, and salicylamide, undergo extensive first pass metabolism and require fast drug input to saturate metabolizing enzymes in order to minimize pre-systemic metabolism. Thus, a constant/sustained oral method of delivery would result in reduced oral bioavailability.

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IN-VIVO ANTIOXIDANT EFFECT OF *ABROMA AUGUSTA* IN DIABETES INDUCED OXIDATIVE STRESS

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ABSTRACT

The present study was aimed to investigate the *In-vivo* antioxidant activity of roots of *Abroma augusta* in streptozotocin-nicotinamide induced Type-II diabetes. The extraction (Hot continuous extraction process) was carried out with solvents of different polarity. Commercially available Vit-E (100 mg/kg b.w.) was used as a standard drug. *In-vivo* antioxidant activity of plant extracts (250 mg/kg b.w.) was assessed by measuring SOD, CAT and LPO in the blood of Type-II diabetic animals. The results of the study revealed the significant effect on SOD, CAT and LPO level in animals treated with petroleum ether extract ($p<0.0001$) followed by aqueous extract ($p<0.001$) of *A. augusta* significantly as compared to diabetic control. The results of the study suggested the antioxidant activity of plant extract which prevents from oxidative stress and provide protection to vital tissues like liver, kidney, heart etc.

Cite this article as: Bisht R, In-vivo antioxidant effect of abroma augusta in diabetes induced oxidative stress, Journal of Drug Delivery and Therapeutics. 2017; 7(7):226-228

INTRODUCTION:

Oxidative stress plays a significant role in the pathogenesis of diabetes. Free radicals are formed disproportionately in diabetes by glucose oxidation, nonenzymatic glycation of proteins, and the subsequent oxidative degradation of glycated proteins[1]. Hyperglycaemia-induced glucose oxidation initiates membrane lipid peroxidation which is vital for the maintenance and integrity of cell function and initiates a non-enzymatic glycation of proteins, which in turn lead to enhanced production of ROS or result in decreased efficiency of inhibitory and scavenging system[2]. Increase in levels of free radicals and the simultaneous decline of antioxidant defense mechanisms can lead to damage of cellular organelles and enzymes, increased lipid peroxidation, and development of insulin resistance. These consequences of oxidative stress can promote the development of various complications of diabetes mellitus[3].

A. augusta Linn (Sterculiaceae), also known as Ulatkambal (Bengali and Hindi), is a large spreading bushy shrub with fibrous barks and irritant hairs. It is widely distributed (native or collective) throughout the hotter parts of India, in U.P, Sikkim, Khasia Hills and Assam[4]. It is widely used in gynecological disorders and also used as abortifacient and anti-fertility agent. A study by Bhuyia *et al*[5], reported the *in-vitro* antioxidant aimed to investigate the the *in-vivo* antioxidant effect of roots of *A. augusta* in diabetes induced oxidative stress.

MATERIAL AND METHODS:

Plant Material

The crude drugs of *Abroma augusta* Linn. (roots) were collected from the local herbal garden of Dehradun, Uttarakhand. The crude drug was authenticated at Forest Research Institute of India (FRI), Dehradun. The voucher specimen (No. 157029) of the plant was deposited in the Forest Research Institute herbarium. Soon after authentication collected parts of the plants were shade dried until they were free from moisture and were ground to coarse powder.

Chemical

Pyrogallol and hydrogen peroxide, phosphate buffer and Tris buffer were obtained from S.D. fine chemicals Ltd., India. Thiobarbituric acid (TBA), Trichloroacetic acid (TCA), 5, 5'dithiobis (2- nitrobenzoic acid) (DTNB) were obtained from Sigma, USA. Vitamin E was procured from commercial sources.

Preparation of Extracts

The powdered plant material was extracted by Hot Continuous Extraction (Soxhletion) method. The extraction was carried out with solvents of different polarity in succession, starting with highly polar solvent

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DOCKING STUDIES ON IMIDAZOLIDINE ANALOGUES FOR MANAGEMENT OF DIABETES

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ABSTRACT

Glycogen synthase kinase-3β (GSK-3β) has recently emerged, in the field of medicinal chemistry, as one of the most attractive therapeutic targets for type II diabetes. Phenylmethylene hydantoins (PMHs) forms strong interactions with the hinge region of GSK-3β; carbonyl oxygen at position 2 form a H-bonding with backbone nitrogen of Val135 and the NH at position 3 to the carbonyl oxygen of Asp133. The hydantoin ring was sandwiched between Ala83, on top, and Leu188, on the bottom. The aromatic ring is rotated out of plane from the hydantoin plane, allowing extensive interactions with the nucleotide-binding loop. Furthermore, the substituted benzylidene ring system builds an H-bonding interaction with the guanidine moiety of Arg141. Targeting Arg141 is important to improve the activity in the process of designing new derivatives because it is considered the selectivity residue for GSK-3β.

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INTRODUCTION:

The insulin insensitive form of diabetes, type 2 diabetes mellitus characterized by hyperglycaemia which is also known as elevated blood glucose concentrations, most frequently arises as a consequence of obesity, represents approximately 95% of the overall incidence of diabetes-I. Additionally, diabetes related complications exert a heavy toll on patients with poor metabolic control [1-5]. Most of kinase inhibitors act by competition with either ATP or metal-binding sites that are involved directly in the catalytic process. Over the past 15 years, there have been extensive efforts to understand and reduce the high attrition rates of drug candidates with an increased focus on physicochemical properties. The fruits of this labour have been the generation of numerous efficiency indices, metric-based rules and visualization tools to help guide medicinal chemists in the design of new compounds with more favorable properties. This deluge of information may have had the unintended consequence of further obfuscating molecular optimizations by the inability of these scoring functions, rules and guides to reach a consensus on when a particular transformation is identified as beneficial. In spite of the early discovery of insulin and its subsequent widespread use in the treatment of diabetes mellitus, and later discovery and use of sulfonylureas e.g. chlorpropamide, tolbutamide and biguanides viz. of diabetes mellitus remains less than satisfactory. Insulin can only be administered intravenously due to its chemical nature, and therefore, is troublesome and inconvenient to use. Oral hypoglycemic agents tend to promote side effects such as excessive hypoglycemia or lactic acidosis. Glycogen synthase kinase-3β (GSK-3β) has recently emerged, in the field of medicinal chemistry, as one of the most attractive therapeutic targets for Type II diabetes. The full potential of GSK-3β inhibitors is yet to be realized and the number of drug candidates being developed by both academic centers and pharmaceutical companies has increased exponentially in the last few years. Glycogen synthase kinase-3β (gsk-3β) is a unique multifunctional serine/threonine kinase that is inactivated by phosphorylation in response to insulin binding; PKB/AKT phosphorylates GSK-3β on serine9, which prevents the enzyme from phosphorylating glycogen synthase. Unphosphorylated glycogen synthase is active & able to synthesize glycogen.

Phenylmethylene hydantoins (PMHs) forms strong interactions with the hinge region of GSK-3β; carbonyl oxygen at position 2 form a H-bonding with backbone nitrogen of Val135 and the NH at position 3 to the carbonyl oxygen of Asp133. The hydantoin ring was sandwiched between Ala83, on top, and Leu188, on the bottom. The aromatic ring is rotated out of plane from

Original Research | Published: 30 May 2017

Computational evaluation of 2-amino-5-sulphonamido-1,3,4-thiadiazoles as human carbonic anhydrase-IX inhibitors: an insight into the structural requirement for the anticancer activity against HEK 293

Mahavir Chhajed, Anil K. Shrivastava, Atika Chhajed, Vijay Taile, Sumeet Prachand & Sanjay Jain

Medicinal Chemistry Research **26**, 2272–2292 (2017)

Abstract

Carbonic anhydrase inhibitors are very interesting target for designing anticancer agents. A computational procedure was performed on some thiadiazoles derived from carbonic anhydrase inhibitor acetazolamide. Two important procedures in computational drug discovery, namely docking for modeling ligand–receptor interactions and quantitative structure–activity relationships were employed. The relationship between cytotoxic activity and various descriptors was established by stepwise multiple regression analysis. The analyses have produced well predictive and statistically significant quantitative structure–activity relationships models,

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Research Article

DESIGNING OF 2, 5-DISUBSTITUTED-1,3,4-THIADIAZOLE DERIVATIVES FOR THEIR ANTICONVULSANT POTENTIAL

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QSAR is the study of quantitative relationships between biological activity and the physicochemical properties of a common parent structure molecule. CS chemoffice software utilized for QSAR of series. The reported IC_{50} values were converted to negative log IC_{50} values, which were correlated with various descriptors. Upon stepwise, multiple, and sequential regression analysis of descriptor, the statistically significant QSAR equations were obtained. The correlation between the physicochemical parameters and the biological activity were found using the least squares method. The equations having good correlation coefficient (r^2), F-test value, SD values and minimum variance were validated by the cross validation method and IC_{50} and pIC_{50} values were calculated using Valstat. 5-Benzenesulphonamido-1,3,4-thiadiazol-2-sulphonamide, was designed as parent structure.

Chhajed M, Shrivastava AK, Chhajed A, Taile V. Designing of 2, 5-disubstituted-1,3,4-thiadiazole derivatives for their anticonvulsant potential, Journal of Drug Delivery and Therapeutics. 2017; 7(7):118-120

INTRODUCTION:

With the evolution of mankind, its confrontation with newer and complex diseases has also been increased. Humanity has always been searching for new ways to overcome the disease, and one of such way is the discovery of the newer drugs for the prophylaxis and/or treating the diseases. Today medicinal chemistry has been trying to reduce the toxicity and increases the therapeutic efficacy of the existing compound by structural modification using computer aided drug design and QSAR[1]. In the early 1960s, one could expect to discover a marketable compound out of 2000-3000 tested molecules, where-as this ratio in now close to 1 in 10000 and biological testing expenses have increased dramatically. Good drug must be replaced by better one, which often seemed to result from a small change in structure of the original or "lead" compound[2]. Drug design is inherently multi-disciplinary and involves the integration of vast amount of complex information, so computational methods can aid in this process. The strategy use in the design of drugs, involved a change in shape such that the new drug had a better 'fit' for receptor. Other strategies involved the change in the physical properties of the drug such that its distribution, metabolism, or receptor binding interactions were affected[3].

The primary objective of the research is to increase the efficiency by designing new drug by making structural modification with the help of QSAR & CADD where the chemical feature of molecules or series of molecules have been correlate to biological activities[4].

MATERIALS AND METHODS:

The workstation

All the computational studies were performed using software CS Chem. Office (Version 6.0).

QSAR analysis of 2,5-disubstituted 1,3,4-thiadiazole

QSAR analysis was carried out on all thirty compounds which are reported previously [5].

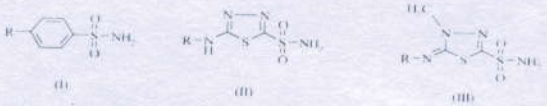

Figure 1: Structure of Sulphonamide and 1,3,4-Thiadiazole Derivatives which are reported as Carbonic Anhydrase Inhibitors are as follows