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Aqueous Ziziphus mauritiana leaf extract pretreatment shields albino rats' livers against alcohol-induced damage.

T.Swathi [1],T.Vijayalakshmi [2],Shilpadas [3],Maheen Zuberiya [4,]
Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

Abstract

Goal: In chronic alcohol-induced liver damage, the impact of an aqueous extract of Ziziphus mauritiana leaf on hepatic lipid peroxidation, decreased glutathione, and overall antioxidant status was investigated. Method: Rats were given an oral 40% alcohol solution (v/v, 1 ml/100 g) for six weeks in order to cause liver damage. Before consuming alcohol, rats in other groups received pretreatment in the form of 200 and 400 mg/kg bw aqueous extracts of Ziziphus mauritiana leaf or 100 mg/kg bw silymarin (reference medication) 30 minutes beforehand. Rats' body weight was recorded once a week. The following biomarkers were assessed: reduced glutathione, lipid peroxidation, total bilirubin, aspartate aminotransferase (AST), and liver total antioxidant status.Results: Compared to control rats, animals given alcohol alone had considerably ($p<0.05$) higher levels of ALT, AST, bilirubin, and hepatic lipid peroxidation, and significantly ($p<0.05$) lower levels of glutathione, total antioxidant status, and body weight. Rats who received an aqueous extract of Ziziphus mauritiana thirty minutes before being administered alcohol showed a substantial ($p<0.05$) decrease in their levels of ALT, AST, bilirubin, and lipid peroxidation when compared to the group that simply received alcohol. When compared to the group that only received alcohol, the administration of Ziziphus mauritiana extract before alcohol consumption substantially ($p<0.05$) raised levels of reduced glutathione and overall antioxidant status. In conclusion, the study's findings suggest that by raising total antioxidant status levels and preventing hepatic lipid peroxidation, an aqueous extract of Ziziphus mauritiana leaf may protect against long-term alcohol-induced liver damage.

INTRODUCTION

Chronic alcohol use increases cytochrome P450 2E1's (CYP2E1) ability to oxidize ethanol by up to ten times, which raises the prooxidative burden1. Ethanol-induced liver damage is partially caused by reactive oxygen species (ROS) produced by CYP2E1 during ethanoloxidation2. The excessive production of these free radicals, which can lead to a state known as oxidative stress4, has been proposed as a factor that plays a central role in many pathways of alcohol-induced damage and has been the focus of much research, even though the pathogenesis of alcohol-induced liver disease is still up for debate3. Several studies have shown that consuming too much ethanol causes the body to produce large amounts of free radicals, which are thought to be linked to alcoholic liver disease5. The primary feature of harmful free radicals, both in vivo and in vitro, is the peroxidation of lipids, which causes tissue damage and cell death in the afflicted cells. Numerous studies have linked the etiology of alcohol-induced liver damage to lipid peroxidation caused by free radicals.7,8. Antioxidants are crucial for defending tissues and cells against tissue damage caused by free radicals. Even though our knowledge of the pathophysiology

Principal
Samskruti College of Pharm.
Kondapur (V), Ghatkesar (M),
Medchal Dist. PIN-501301

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Drug target selection and bioinformatics for the prevention of malaria

S.Kiran [1],Dr.Smithamadhuri [2],G.Suresh [3],Kunusoth Nagaraju [4,]

A key element of malaria control programs is the use of antimalarial medications. These medications fall into the following categories: antibiotics, atovaquone/proguanil, antifolates, quinolines, and artemisinins. Drug resistance is progressively compromising their efficacy. Therefore, lowering the rising illness burden and financial loss from malaria depends on the creation of novel antimalarials and the enhancement of those that already exist. The most virulent human malaria parasite, Plasmodium falciparum, and a rodent parasite, P. yoelii yoelii, have released their genome sequences. This has created new avenues for intensive research aimed at identifying critical parasite determinants encoded in the genomes that may be targets for drugs or candidates for drug discovery programs. The capacity to assess the effectiveness of medications in reliable model systems before conducting clinical trials may become possible with the release of genome sequences of additional human and rodent malaria parasites as well as those of primates in the future. Integration of diverse data from high-throughput technologies, including genome and cDNA sequencing, microarrays, proteomics, structural genomics, and metabolic networks, will be necessary to address the difficulty of finding appropriate therapeutic targets. For this integration to work, bioinformatics techniques must be used to mine databases in order to find patterns that distinguish parasite determinants as promising targets for drug research. Yuthavong1 lists the following qualities of a good malaria drug target: (i) a crucial aspect of the parasite life cycle that must differ significantly from any similar process in the host; (ii) the absence of alternative pathways that avoid the target; (iii) the parasite's preferred accessibility or lead compound accumulation within it; (iv) low potential for drug resistance development; (v) involvement in a rate-limiting biochemical process; and (vi) the ability to easily test the effects of inhibitors on the target (to validate the target). (vii) the availability of a simple test method for high-throughput screening; (viii) the presence of known specific inhibitors and varying selectivity for inhibition from the host enzyme/receptor.

Thorough examination of the roles and interactions of candidates within the framework of a host-parasite relationship is essential prior to including them in the whole discovery process. Several bioinformatics techniques that use biological data include gene expression analysis, acquisition of foreign genetic material search, and positive selection gene scanning. Understanding the regulation of malaria parasite genes is essential for taking advantage of them as targets. This includes understanding the variations in expression levels, timing, and tissue, as well as how they vary from host genes. Compared to species like yeast or its apicomplexan cousin Toxoplasma gondii, less is known about the processes of transcription and translation in malaria parasites. For instance, further research is required to fully understand the function of alternative splicing. Multiple protein isoforms may be a way for P. falciparum to redirect the host immune response away from the predominant functional isoform, according to early research on alternative transcripts in the species. Inhibitors tailored to the main isoform may be designed using temporal and geographical data on protein diversity.

Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

SAMSKRUTI COLLEGE OF PHARMACY Kondapur (V) Ghatkesar (M) R.R. Dist. Hyd.

Principal
Samskruti College of Pharmacy
Kondapur (V), Ghatkesar (M),
Medchal Dist. PIN-501301

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Developing a Validated HPTLC Methodology to Measure Eclipta alba's Linoleic and Oleanolic Acid

Ch.Sushma [1],Mercy Florence [2],V.Raju [3],M.Venkatesh [4],

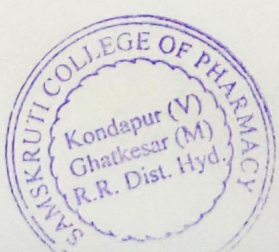
ABSTRACT

A well-known medicinal plant found in tropical and subtropical areas of the globe is Eclipta alba (Asteraceae family). It is one among the herbs most often used in traditional medicine, such as folk medicine, Ayurveda, Siddha, homeopathy, and Unani. Every part of this therapeutic plant has a multitude of important phytochemical components, such as triterpenes, flavonoids, coumestans, steroids, saponins, and polypeptides. E. alba is a key medicinal component in many herbal and ayurvedic preparations, such as Liv.52 Gnx tablet and Indulekha brengha oil. Developing a reliable and consistent HPTLC method for measuring oleanolic and linoleic acid in E. alba simultaneously was the goal of the present study. The process yielded compact bands upon derivatization with anisaldehyde-sulfuric acid reagent. The stationary phase of the technique was silica gel 60 F254, while the mobile phase consisted of ethyl acetate, toluene, and formic acid at a ratio of 4:7:0.2 (v/v/v). The linear regression data for the standard linoleic and oleanolic acid calibration curves had correlation coefficients (r2) of 0.9966 and 0.9964, respectively. These values showed a strong linear relationship over a range of concentrations between 300 and 1500 ng/spot and 450 and 1600 ng/spot, respectively, with respect to the area. We evaluated the selectivity, robustness, accuracy, and precision of the technique.

Introduction

The world has become more aware of herbal treatments as a result of inadequate drug controls.[1] The WHO has underlined the need of developing physicochemical characteristics and using state-of-the-art analytical procedures to guarantee quality in crude pharmaceuticals. The complex and variable composition of the material must be considered in analytical control, and methods including chemistry, physicochemistry, and instrumentation must be used to provide a sufficient standard.[2] Eclipta alba is referred to by many local names, including bhumiraj, bhringraj, and aali jhar, in addition to the common English name "False Daisy."[3] E. alba is a medium-sized, branching annual plant native to tropical and subtropical regions of the globe that has white blooms.[4,5] It is historically used to heal wounds, dermatitis, and prevention of baldness, among other skin diseases.Babies with diarrhea may be treated with leaf juice and honey.[6,7] E. alba juice is used either topically or as a rally to promote hair growth.[8] The leaves and shoots are used in Nepal to treat wounds and stop infections.Many ethnic populations in South American countries utilize it to treat snakebite injuries [9, 10].Because of its anti-aging and revitalizing properties, it is employed in Ayurveda.[12] Several ethnic groups in Bangladesh utilize it to treat jaundice.[13, 14] This plant juice has been used to stop the spread of illness and eliminate insects that transmit it, such as mosquitoes.[15, 16] Additionally, it is used to treat a wide range of ailments, such as acidity, baldness, gingivitis, bronchitis, asthma, burns, wounds, constipation, fever, body pains, wrinkles, acne, and other skin issues [17].[18–21]

Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.



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Principal
Samskruti College of Pharmacy
Kondapur (V), Ghatkesar (M),
Medchal Dist. PIN-501301

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Quantitative Evaluation of Intravitreal Drug Delivery

Mercy Florence [1],Ch.Sushma [2],G.Ratnakumari [3],Mohammad Afrah [4,]

Abstract

A quasi-steady-state model of intravitreal drug distribution is being developed and tested in this study with both healthy and sick eyes to see how different model parameters affect drug distribution.Approach: By combining Fick's rule of diffusion with Darcy's law of convective flow and Michaelis-Menten kinetics of metabolism, a simple mathematical model was created to represent the intravitreal transport of medications. We used a Crank-Nicolson finite difference scheme to model the drug transport equation in the vitreous body. We used central differences to approximate the radial and axial diffusive terms and the convective terms, and we used the average of forward and backward time differences to approximate the temporal terms. The line Jacobi iterative strategy was used to solve a system of linear algebraic equations that were derived using the Crank Nicolson finite difference scheme. The outcomes were successively better approximations.The results show that the concentration of the intravitreal drug near the center of the retina and along the vitreous body's centerline decreases as the metabolic rate and drug release rate constant rise, according to the model. In eyes affected by glaucoma or retinal detachment, the drug concentration increases at the center of the retina and along the vitreous body's central line, and it decreases at a faster rate than in healthy eyes.Conclusion: The vitreous outflow, which is seen in eyes with glaucomaand/or rhegmatogenous disease, could help move drugs injected into the vitreous body. In these sick eyes, the drug concentration in the vitreous body and central retina is greater than in healthy eyes, and the rate of drug concentration degradation is also greatly elevated.Topics covered include intravitreal injection, convective-diffusive transport, the line-Jacobi iterative approach, and release rate.

INTRODUCTION

Several vitroretinal diseases such as cytomegalovirus retinitis, age- related macular degeneration (AMD), retinitis pigmentosa (R.P), diabetic retinopathy and a combination of similar retinal diseases are currently being treated by using drug intravitreal injection or control release implant of drugs1. The diffusion of drug, convection of vitreous outflow, enzymatic reaction (metabolism), drug binding and efficacy of delivery system mainly control the bioavailability of drug after its intravitreal injection and controlled release implant. Many drugs used to treat vitreoretinal diseases have a narrow concentration range in which they are effective and may be toxic at higher concentrations 2, 3. Therefore, it is critical to know the drug distribution within the vitreous following delivery by intravitreal injection or controlled release implant. The ability to predict drug distribution can maximize the therapeutic benefits and minimize potential adverse effect such as possible tissue damage caused by excessively high concentrations of drug. A mathematical analysis of the drug concentration and theoretical investigation of the effects of physiological parameters on the concentration may elucidate the mechanism of drug transport in the vitreous and may contribute to the improvement of present understanding of the bioavailability of drugs required for the treatment of vitroretinal diseases. Several studies4, 5, 6 ,7 have analyzed intravitreal drug distribution and the elimination of drug from the vitreous of the eye. Previous studies6, 8 have assumed that the vitreous humor was stagnant, ignoring convective drug transport within the vitreous body. It is well known that during the pathogenesis of glaucoma, intraocular pressure (IOP) is elevated (40-80 mm Hg) due to the obstruction of the aqueous outflow

Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

SAMSKRUTI COLLEGE OF PHARMACY
Kondapur (V)
Ghatkesar (M)
R.R. Dist. Hyd.

Principal
Samskruti College of Pharm...
Kondapur (V), Ghatkesar (...
Medchal Dist, Pin-501...

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Ficus benghalensis: A shrub with possible pharmacological uses in both medicine and folklore

L.Sunil [1],K.Swetha [2],Mercy Florence [3],Kunchala Sravani [4,]

Abstract

The goal is to conduct a summary of Ficus benghalensisis's possible pharmacological characteristics.
Methods: Using the keywords "Ficus benghalensis," "medicinal plants," "anti-oxidant," "anti-inflammatory," and "anti-cancer," data were gathered from a number of internet sites, including Scopus, Elsevier Science Direct, PubMed, and Sci-Hub. Findings: Terpenoids, ketones, coumarins, oentacyclic, furocoumarin, flavonols, flavonoids, sterols, esters, carbohydrates, carboxylic acid, and polycyclic aromatic hydrocarbons are among the useful secondary metabolites found in Ficus benghalensis. It is thought to be a plant with potential pharmacological qualities such as anti-inflammatory, anti-cancer, anti-oxidant, anti-bacterial, anti-diabetic, anti-tumor, immunomodulatory, anthelmintic, and anti-angiogenic according to its phytochemical profile. This review focuses on Ficus benghalensis's phytochemistry, traditional applications, and pharmaceutical potential.
In conclusion, Ficus benghalensis may be used to cure a variety of illnesses. However, further investigation is required to precisely determine its biological and pharmacological functions, including preclinical trials and in vivo investigations.

Keywords: Ficus benghalensisis, medicinal plants, immune-modulatory, anti-cancer, and antioxidant

INTRODUCTION

Over time, natural products obtained from plants gained importance for treating various diseases [1]. Plants-based natural products provide a vast array of chemical compounds to be experimented with as new drug candidates [2]. The first written record of traditional drug systems from plants was found around 2600 BC. This system had about 1000 substances extracted from plants, a few of which were predominantly utilized for oil extraction in Mesopotamia. Egyptian medicine is as old as 2900 BC, but the most famous record dates back to 1500 BC and is known as "Ebers Papyrus", with about 700 drugs basically derived from plants [3]. Presently, plant products are integral components of healthcare systems in many parts of the world. The reason behind using herbal products is the low price of plant-derived traditional medicines [4]. Bioactive compounds are generally secondary metabolites, i.e., steroids, alkaloids, tannins, and phenolic compounds are isolated from plants. Various plant-based natural products are used as direct chemotherapeutic agents, while many others decrease the severe effects experienced due to chemotherapy [5].

Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

SAMSKRUTI COLLEGE OF PHA
Kondapur (V)
Ghatkesar (M)
R.R. Dist.

Principal
Samskruti College of Pharmac
Kondapur (V), Ghatkesar (M)
Medchal Dist. PIN-501301

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Through modulating SIRT3, theacrine reduces inflammation and lung damage in septic mice.

Dr.Nadeem [1], Dr.K.Nagarsee [2],V.Raju [3],Atowar Rahman [4].

Abstract

The *goal of this study is to determine how theacrine affects the development of sepsis and the severity of lung damage caused by sepsis. Methods: The mice were given injections of 3 mg/kg LPS dissolved in 50 µL PBS or only PBS (control group = 10), creating a lung damage model of lipopolysaccharide (LPS)-induced sepsis. One hour after LPS treatment, theacrine was orally gavaged to the other three groups of mice (ten mice per group) at doses of 10, 20, and 40 mg/kg, respectively. The impact of theacrine on lung damage was confirmed by hematoxylin and eosin (H&E) staining. We measured oxidative stress and inflammatory factors using enzyme-linked immunosorbent assays (ELISA) and quantitative polymerase chain reactions (qPCR). The impact on apoptosis and mechanism of action were confirmed using TUNEL and immunoblot tests. Results: In mice with LPS-induced sepsis, theacrine had a significant impact on lung injury and lung relief score ($p < 0.01$). It also reversed the increased levels of inflammatory cytokines in a dose-dependent manner ($p < 0.01$). Furthermore, theacrine significantly reduced the intensity of increased levels of ROS and MDA, and improved the levels of SOD in lung tissues ($p < 0.01$). In addition, it reduced lung damage and enhanced LPS-induced cell death in the lungs via activating the SIRT3 pathway ($p < 0.01$). Results: Theacrine reduces inflammation and lung damage in septic mice by modulating SIRT3, suggesting it may be a promising therapeutic development lead for sepsis-related lung injury and inflammation. Tags: SIRT3 pathway, oxidative stress, sepsis, lung damage, theacrine*

INTRODUCTION

Sepsis is defined as an organ dysfunction caused by an aberration in the host's response to infection [1]. Nearly 30 % of patients with sepsis develop multiple organ dysfunction syndrome. The lungs are one of the most vulnerable organs to sepsis [2]. Lipopolysaccharide (LPS) could induce acute inflammation by stimulating host cells to produce inflammatory cytokines and also induce acute lung injury (ALI) by recruiting activated neutrophils as well as macrophages into the lungs [3,4]. Drug therapy is very important for the treatment of sepsis patients and to improve the therapeutic effect, there is a need to develop a large number of effective therapeutic drugs to improve the cure rate [5-7]. SIRT3 is an NAD-dependent deacetylase mainly confined to the mitochondria and its deficiency is related to the regulation of mitochondrial function and redox homeostasis [8]. Previously, it has been reported that expression of SIRT3 is reduced in LPS-induced acute lung injury and SIRT3 deficiency also aggravates LPS-induced inflammation and ROS production, making acute lung injury more serious [9]. So far, studies have shown

Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

SAMSKRUTI COLLEGE OF PHARMACY Kondapur (V) Ghatkesar (M) R.R. Dist. Hyd.

Principal
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M),
Medchal Dist. PIN-501 201

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Increasing cases of severe psychopathology linked to cannabis (marijuana, hemp) misuse

Dr.Smithamadhuri [1],S.Kiran [2],L.Sunil [3],lavanya.N [4,]

Abuse of alcohol, tobacco and other drugs (substance abuse) continues to be one of the most significant medical, social and economic problems facing mankind. It is an important factor in disruption of family and social relationships, accidents, crimes, violence, disease and illnesses, disability, suicide and homicide and loss of productivity. Globally, it is estimated that about 200 million persons or 5% of world population aged 15 – 64 have used drugs of abuse at least once in 2003[1]. About 161 million persons or 4% of World population (aged 15 – 64) are estimated to have used cannabis during the same period. Estimates for cocaine, heroin and amphetamine–type drugs are: 13.7 million (0.3%), 10.6 million (0.23%) and 26.2 million (0.6% of world population aged 15 – 64), respectively. It is clear that cannabis is by far the most commonly used illicit drug world–wide (4% of world population compared to 1% for all other drugs of abuse combined). The most psychoactive constituent of cannabis is the 9-delta tetrahydrocannabinol (THC). The main effects of cannabis are exerted through the cannabinoid receptors which are located in various parts of the brain, including the cerebellum, hippocampus, cerebral cortex, nucleus accumbens, basal ganglia, hypothalamus and the brain stem. THC is rapidly absorbed and the effects are experienced within minutes. If the cannabis is of low potency, the effects may be subtle and brief. Effects of cannabis last for 2 – 3 hr after a single cigarette. Regular users prolong effects by repeated smoking. When taken orally, onset of action is delayed for about 30 min to 2 hr but action is prolonged. Acute intoxication and chronic use of cannabis are associated with negative consequences and substantial health burden. Perceptual and psychic changes are biphasic, an initial euphoria ("high") is followed by drowsiness. Time sense is altered, hearing is less selective, vision is sharper with many vision distortions. Depersonalization, difficulty in concentrating and thinking,

dream – like states are prominent[2]. Acute psychomotor effects include impairment of coordination and reaction time and impaired driving skills. The effects of cannabis are highly variable and depend upon the dose, pattern of use, previous experience with the drug, concurrent use with other drugs, user's expectations and social environment and the mood of the user. A substantial proportion of persons who use cannabis also engage in alcohol consumption, a combination that produces a synergistic increase in the effects which are associated with more problems than either substance alone[3]. Experiments in rats by Professor Yasin Hurd of Karolinska Institute, Stockholm, Sweden, show that chronic periodic use of cannabis can interfere with brain development. This may suggest that children and young adults who use cannabis over long periods would be more prone to the psychopathology of the drug. Cannabis induced conjunctival reddening and the increase in pulse rate correlate quite well in time with the

Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

Principal
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M),
Medchal Dist. PIN-501301

SAMSKRUTI COLLEGE OF PHARMACY Kondapur (V) Ghatkesar (M) R.R. Dist. Hyd.

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Botulinum toxin type A's effect on hypertrophic scars in vitro and how it works

Dr.Narasaiah [1], Shiva Srikrishna [2],G.Ratnakumari [3],Baddam Vinitha [4],

Abstract

Objective: To investigate how botulinum toxin type A (BTXA) contributes to the development of hypertrophic scars.
Methods: Isolated and cultivated HSF cells came from hypertrophic scars. The expressions of TGF-β1, FN, and Col1 in normal and hypertrophic scar tissues were determined using immunohistochemistry (IHC) assays. In HSF cells, the expressions of α-SMA, Col1, and FN1 were assessed using immunoblot techniques, along with the expressions and phosphorylation of p38, ERK, and JNK. To determine how BTXA affected the proliferation and migration of HSF cells, researchers used the CCK-8 and Transwell assays.
Findings: The MAPK pathway was inhibited in hypertrophic scar fibroblasts by BTXA ($p < 0.01$). Additionally, it inhibited the development and motility of HSF via the MAPK pathway ($p < 0.01$) and reduced the amount of collagen deposits in hypertrophic scars ($p < 0.01$).
The results show that BTXA inhibits hypertrophic scarring via the MAPK pathway, suggesting that it may be useful as a medication to treat this condition.
Topics covered include hypertrophic scar, fibroblasts, collagen deposition, Botulinum toxin type A (BTXA), and the MAPK pathway.

INTRODUCTION

Physical trauma can cause skin damage and scarring problems [1]. In developed countries, about 100 million people suffer scarring related problems each year [2]. Most superficial injuries do not leave significant scarring [3,4]. Both hyperplastic scars and keloids can cause a range of cosmetic and functional problems such as contracture, as well as self-reported itching and pain [5,6]. Botulinum toxin is a potent neurotoxin produced by the Botulinum clostridium, which has been proven to inhibit scar formation and improve wound healing [7]. Botulinum toxin type A (BTXA) is available for clinical use in treating hypertrophic scarring [7,8]. BTXA can reduce collagen deposition in hypertrophic scars by inhibiting phenotypic conversion of fibroblasts to myofibroblasts [9]. Dysregulation of TGF-β/Smad signaling is a major factor in the framework of scarring and fibrosis, leading to abnormal collagen synthesis and deposition, higher proportions of collagen I/III and the formation of abnormally cross-linked collagen fiber bundles [10]. TGF-β plays a key role in producing the myofibroblast phenotype, which is responsible for large collagen deposition and wound contraction [11]. TGF-β1 regulates tissue homeostasis through a variety of cellular

Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India

Principal
Samskruti College of Pharmacy
Kondapur (V), Ghatkesar (M),
Medchal Dist. PIN-501301

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An overview of disintegration testing for oral disintegrating tablets (ODTs)

K.Swetha [1], L.Sunil [2], Ch.Sushma [3], Kudurupaka Sindhuja [4]

Abstract

Orally disintegrating tablet (ODT) prescriptions are often written. ODTs are among the most preferred dose forms for a number of demographics, including kids and the elderly. These are solid dose forms that, as soon as they come into touch with saliva in the patient's mouth, are meant to dissolve or disintegrate extremely fast. The United States Pharmacopeia (USP) states that in order to guarantee consistency and efficacy, each dosage form must successfully complete a series of quality control tests. The disintegration test is essential for ODTs in order to determine how long it takes for tablets to decompose and release their contents for absorption and dissolution. It is also an essential predictive test for figuring out the relationship between in vitro and in vivo. As mentioned in the USP, however, there are no required uniform disintegration testing requirements for ODTs. Recent USP, on the other hand, relates to particular manufacturer monograph standards, which might differ between monographs. This article elaborates on the benefits and drawbacks of a number of developed disintegration tests and methods for ODTs, including basket rack assembly, CCD camera, texture analyzer (TA), special disintegration equipment, prototype disintegration tester (PDT), simple approach, and modified wetting test.

Keywords: USP physical test, disintegration test, oral disintegrating tablets (ODTs), super disintegrants

INTRODUCTION

Orally disintegrating tablet (ODT) is an emerging and important dosage form in pharmaceutical market. It was developed by R.P. Scherer Corporation in 1986 and was first introduced into Swedish market as Zydis technology to formulate famotidine ODT in 1993[1]. Approval by FDA was done in 1996 for its use to formulate Claritin RediTabs by Schering-Plough. Currently, numerous other ODT technologies by several pharmaceutical companies and research groups are available as well [2]. Orally disintegrating tablet ODT formulations were mainly developed for existing drugs. This is because it extends product self-life, expands solid dosage form market, and avoids counterfeiting. Oral disintegrating offers ease of administration, and convenience for special populations like patients who cannot swallow tablets (pediatrics and geriatrics), patients with swallowing difficulties (dysphagia), or those who have limited access to water. Some ODT formulations allow for a high drug load, leave no grittiness or sandy feeling in mouth, allow for masking taste of bitter drugs via drug encapsulation, coating, or by using various excipients, and provide good stability. In addition to convenience of administration, ODT formulations allowed for extending product life-cycle for manufacturers, expanded market size for solid dosage forms, and reduced counterfeiting potential. Formulation of ODT has been studied as a way of improving bioavailability of poorly water-soluble drugs and it has been observed that ODT increases the bioavailability of such drugs [3]. There are various challenges involved in formulation and development of ODT which include achieving adequate tablet hardness, accommodating high drug load, efficiently masking a bitter taste, leaving a good mouth feel following tablet disintegration, avoiding additional costs for special packaging required for friable tablets, and maintaining physical and chemical drug stability during storage [3].

Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

Principal
Samskruti College of Pharm.
Kondapur (V), Ghatkesar (M),
Medchal Dist. PIN-501301

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The pharmaceutical sector faces the challenge of brittle fracture during tableting.

G.Suresh [1], G.Thanusha [2], S.Kiran [3], Kothuri Jhansirani [4,]

Abstract

When the tablet dies at the time of ejection from the machine, a brittle fracture occurs, causing the tablet to cap and laminate. The existence of low density areas or trapped air (voids) in the tablets is the main cause of the issue. The second area, known as the low density zone, occurs when the tablet does not compress evenly. Cracks in the tablet may start and spread from the voids or low-density areas when it's exposed to diametral stress, such die wall pressure. Therefore, stress accumulation at the void or low-density region's edge causes brittle fracture. There is a clear association between the plasto-elasticity of materials and the brittle fracture index (BFI) of the resultant tablets, which supports the idea that sudden elastic recovery after tablet ejection from the die might be a source of brittle fracture.1- 3. This indicates that brittle fracture is more common in materials with a high degree of elastic modulus compared to plastics. However, the idea that cracks propagate from points of stress concentration at void edges is more widely accepted. Since plastics easily distort under stress, they mitigate brittle fracture by distributing the force that would have otherwise built up at the void's periphery.4-5.To quantify the brittle fracture propensity, Hiestand et al.4 used crack theory and came up with an equation. Therefore, a tablet's brittle fracture index (BFI)

INTRODUCTION

may be calculated as follows:

$$BFI = 0.5\,(T/T_0 - 1)$$

where To and T are the tensile strengths of tablets with and without a centre hole, respectively. The centre hole (≤0.6mm) is a built-in model defect to simulate actual void formed in the tablet during compression. For brittle fracture to occur, the ratio $T/T_0 = 3$. By subtracting 1 and multiplying by 0.5 the maximal BFI value is 1 (unity). The BFI value thus has a range of 0 (no fracture tendency) to 1 (maximal fracture tendency). Tablet samples with BFI values (≥0.5) displayed a high fracture incidence during actual tableting .

Brittle fracture during tableting is considered a problem for the pharmaceutical industry because it is associated with formulation factors such as insufficient binder, a high plastoelasticity of the tableting base, and process factors such excessive compression pressures and overdrying of granules/ powders. Very often tableting is halted as soon as brittle fracture is observed; the batch is either rejected or reprocessed, which is un-economical.

Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

Principal
Samskruti College of Pharmacy
Kondapur (V), Ghatkesar (M),
Medchal Dist. PIN-501301

This Memorandum of Understanding (The "MoU") Is from 08-12-2021 to 08-12-2024 by **SAMSKRUTI COLLEGE OF PHARMACY** and **I LABS**, With an Address of KONDAPUR (V), GHATKESAR (M) MEDCHAL DIST (OLD R.R. DIST), HYDERABAD 501301 TELANGANA, INDIA. **DR .D.VENKATARAMANA (Principal)** And Flat No 301, Road No 02, Nanal Nagar, Mehdipatnam, Hyderabad, Telangana 500028, **Naveen. M(Director),** Also Individually Referred to as "Party", and Collectively "The Parties."

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AND

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(First Party and Second Party are hereinafter jointly referred to as 'Parties' and individually as 'Party') as

WHERE AS, the Parties desire to enter into an agreement on 08/12/2021 to 08-12-2024; and

WHERE AS, the Parties desire to memorialize certain terms and conditions of their anticipated endeavor;

SAMSKRUTI COLLEGE OF PHARMACY Kondapur (V) Ghatkesar (M) R.R. Dist. Hyd.

Principal
Samskruti College of Phar
Kondapur (V), Ghatkesar (
Medchal Dist. PIN-501

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Design and In-vivo Assessment of Quercetin-Based Nanosponges Buccal Quercetin Tablets

Dr.Ratnasree [1],Dr.Rafia [2],Shivaprasad [3],Noureen[4,]
Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India

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ABSTRACT

The goal was to use cyclodextrin-based nanosponges to create a controlled release formulation that would boost quercetin's bioavailability. Using the freeze-drying method, a 3-factor, 3-level Box-Behnken design containing quercetin was loaded into nanosponges based on the results of preliminary testing. After being manufactured, characterized, and formed into tablets, the prepared nanosponges were inspected. The drug release percentages at six hours range from 53.04 to 82.64% for the quercetin-loaded nanosponges, whereas the particle sizes range from 36.45 to 135.27 nm and the encapsulation efficiencies from 42.37 to 88.44%. The Quercetin-nanosponge interaction was confirmed by FTIR, DSC, and XRD analyses. After the nanosponges were converted into tablets, the medication released from them at a rate of 99.75% in vitro, and stability tests revealed no appreciable alterations six months later. Rats were used in in vivo investigations to compare the Cmax of quercetin optimized nanosponges tablets (6.27 ± 0.06 ng/mL) to the Cmax of the pure medication (3.07 ± 0.086 ng/mL), which was substantially lower (p<0.05). The Tmax values for the pure drug solution and the nanosponges tablet formulation were 0.5 ± 0.08 h and 4.0 ± 0.07 h, respectively.

Introduction

Of all the flavonoids discovered to date, quercetin (3,3',4',5,7-pentahydroxy-f lavone) is the largest member of the flavonol subclass. Among other biological and pharmacological effects, it has been shown to have anti-cancer, anti-oxidation, anti-inflammatory, blood cholesterol-lowering, coronary artery dilation, anti-platelet aggregation, anti-anemia, and antianaphylaxis qualities.[1] Nevertheless, quercetin is a challenging molecule to deliver therapeutically because of its poor solubility, low hydrophilicity (log p-value of 1.81), gastrointestinal instability, high first-pass metabolism, and little absorption in the gastrointestinal tract. Quercetin is classified as a class II BCS substance.[2] It dissolves at 7.7 in water, 5.5 lg/mL in gastric simulated fluid, and 28.9 lg/mL in intestinal simulated fluid (SIF). The medication's therapeutic usage in conventional dosage forms is limited due to its oral bioavailability, which has been shown to be less than 17% in rats and even less than 2% in humans.[3] As a result, a more potent form of quercetin that has improved absorption and action is required. Regarding the many drug delivery methods that have been documented in the literature, quercetin nanoparticulate formulation seems to be a good choice for simultaneously enhancing stability and solubility. Recently, cyclodextrin polymers hypercross-linked and nanostructured to produce three-dimensional networks have been converted into nanosponges. Cyclodextrin is reacted with an appropriate crosslinking agent, such as diphenyl carbonate or carbonyl diimidazole, to create the nanostructured materials. Natural

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Principal
Samskruti College of Pharm
Kondapur (V), Ghatkesar (...
Medchal Dist. PIN-501301

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Lumefantrine Solid Dispersion Formulation Development and Characterization with Piperine for Solubility Enhancement

Dr.Rafia [1],Dr.Ratnasree [2],V.Raju [3],Nethikoppula Pravallika [4],
Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

To Cite this Article

Dr.Rafia [1],Dr.Ratnasree [2],V.Raju [3],Nethikoppula Pravallika [4]," **Lumefantrine Solid Dispersion Formulation Development and Characterization with Piperine for Solubility Enhancement** *"*
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ABSTRACT

Lumefantrine's limited water solubility and variable bioavailability are linked to its crystallinity and efflux mediated by P-glycoprotein (P-gp). Here, amorphous solid dispersions (SD) of lumefantrine (LUMF) including piperine (PIP), a P-gp and CYP3A4 inhibitor, were produced using Copovidone/Kollidon® VA 64 (KOL) at three different ratios with increasing polymer content in order to increase the dissolution and, therefore, the oral bioavailability. Using DSC, FTIR, and XRD, the PIP-LUMF-KOL SD at a ratio of 1:6:18 showed increased aqueous solubility of LUMF. While FTIR tests looked into potential intermolecular interactions between LUMF and PIP and/or KOL, the DSC thermogram and XRD diffractogram of LUMF-PIP-SD validated the enhanced dissolving brought on by LUMF's loss of crystallinity. The stability of LUMFPIP-Sol SD under stressful temperature and humidity conditions for 90 days was confirmed by DSC and dissolving studies. Overall, the findings point to the possibility that increasing the SD of LUMF combined with P-gp inhibitor PIP may improve solubility and, in turn, increase LUMF's bioavailability.

Introduction

The biopharmaceuticals class II lumefantrine (LUMF), an antimalarial crystalline molecule, has limited water solubility and low/variable oral bioavailability (4-5%).[1-3] Because of its poor solubility in water, active efflux caused by the ATP-dependent efflux protein P-gp, and metabolic inactivation caused by CYP3A4, LUMF has a limited bioavailability.[4] Various approaches have been investigated to enhance the water solubility and oral bioavailability of LUMF. These include wet nano-milling, self-nano-emulsification, pheroid, pro-pheroid, and pheroid-emulsification. Nevertheless, the intricacy of these methods restricts their use.

Solid dispersions (SD) are extensively used to overcome the lattice energy limitations of crystalline drugs, hence increasing solubility and oral bioavailability.

By dissolving weakly watersoluble drugs in hydrophilic or amphiphilic carriers, the SD process transforms crystalline substances into amorphous ones.[7] Higher free energy combined with an amorphous form is thought to be responsible for the increase in apparent solubility, dissolving rate, and bioavailability.[8–11] The carrier polymer in SD prevents the thermodynamically unstable transition of an amorphous system to a stable crystalline state. This is done primarily through ant plasticization, specific drug–polymer interactions, reduced molecular mobility, energy barrier for crystal nucleation, and other mechanisms.[17] While a number of techniques, including as spray drying, hot melt extrusion, solvent evaporation, anti-solvent precipitation, freeze drying, and hot melt extrusion, have been used to synthesize SD, their primary disadvantages are the costly equipment and complex procedures they need. If toxicity or physical instability brought on by fast recrystallization, linked to ant solvent precipitation, solvent evaporation, and spray

SAMSKRUTI COLLEGE OF PHARMACY Kondapur (V) Ghatkesar (M) R.R. Dist. Hyd.
Principal Samskruti College of Pharm. Kondapur (V), Ghatkesar (M), Medchal Dist. PIN-501301

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Metformin hydrochloride-loaded biodegradable microspheres employing the Box Behnken design for local delivery in periodontitis: design, optimization, and characterization

Adithyamathur [1],Shivaprasad [2],Dr.Rafia [3],Nasim Aktar [4,]
Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

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ABSTRACT

In the current research, periodontitis was treated by filling periodontal pockets with metformin hydrochloride-loaded microspheres, either with or without grafts. In order to do this, chitosan was selected as the polymer and used in various drug/polymer ratios during the emulsion cross-linking process to create microspheres. Utilizing a three-factor, three-level Box–Behnken architecture allowed for optimization. Regression analysis was used to create mathematical models for the responses of particle size (PS) and entrapment efficiency (EE). The experimental design considered the economical reduction of chemical usage and formulation time to develop an optimized formulation with highest %EE and minimal PS under optimal process conditions for the microsphere formulation. Based on the desirability function, the optimal formulation was chosen, and it was then assessed in terms of particle size, entrapment efficiency, drug release in vitro, differential scanning calorimetry (DSC), fourier transform infrared (FTIR) spectroscopy, and surface morphology investigations. Kinetic and statistical analyses were performed on the release study findings. The chosen batch's particle size and entrapment effectiveness were determined to be between 40.2 and 59.6 μm and 85 and 95%, respectively. The drug's molecular dispersion and transformation into an amorphous state were shown by the DSC investigations. By using scanning electron microscopy (SEM) to examine the surface morphology of the microspheres, it was discovered that they had a smooth, spherical surface.

Introduction

Type 2 diabetes is treated with metformin hydrochloride, a second-generation biguanide, as a hypoglycemic medication.[1] Metformin hydrochloride has been demonstrated to have osteogenic activity in addition to its established use in the treatment of diabetes. It has shown a dose-dependent rise in the proliferation of two osteoblast-like cells (MC3T3E1 and UMR106). Additionally, it has increased the synthesis of type-I collagen in both cell lines and encouraged. Activity of alkaline phosphatase in osteoblasts MC3T3E1.[2] A group of inflammatory illnesses known as periododontitis affect the tissues that support and surround the teeth, called the periodontium. It results in the gradual loss of the alveolar bone around the teeth by destroying the attachment system of the teeth, which creates the periodontal pocket and normal osseous structure.[3] Treatments for periodontitis may be divided into two categories: regenerative and anti-infective. The regenerative therapy method is the foundation of the present investigation. Bone regeneration is necessary for the treatment of periodontitis since the condition causes a gradual loss of alveolar bone. Bone transplants are used in conventional treatment for bone repair. These solid bone grafts are inserted into the affected area to promote bone regrowth. As a regenerative treatment for periodontitis, chitosan

SAMSKRUTI COLLEGE OF PHARMACY Kondapur (V), Ghatkesar (M), K.R. Dist, Hyd.

Principal
Samskruti College of Pharmacy
Kondapur (V), Ghatkesar (M),
Medchal Dist. Pin-501301

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LC-MS/MS-Based Selective Degradant Separation and Mass Spectral Characterization of Viloxazine

Shivaprasad [1],Adithyamathur [2],Dr.Ratnasree [3],Nabab Ali Molla [4],
Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

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ABSTRACT

This study presents a unique method for the selective extraction of degradants from API using HPLC and online connection of a SCIEX QTRAP 5500 mass spectrometer with a triple quadrupole mass analyzer and PDA detector. Chromatography was employed using mobile phase ACN: 0.1% TEA (40:60) %v/v to separate all degradants on the Agilent Eclipse XDB (150 mm x 4.6 mm, 3.5 µ) column. It was discovered that the maximum absorption occurs at 220 nm, allowing for simultaneous detection unaffected by the placebo matrix. It was decided to approve the recommended RP-HPLC technique in accordance with the general ICH guidelines. The parameters that were considered adequate were specificity, linearity, LoD, LoQ, accuracy, precision, and robustness of validation. The suggested approach demonstrates excellent linearity and robust correlation over the range of 12.5–75 µg/mL. The precision tests' percent RSD was less than 2%, whilst the accuracy trials yielded consistent recoveries (95–105%). It may be possible to determine the inherent stability of the drug molecules in the present formulation by doing forced degradation tests and evaluating the degradation products generated under different stress conditions. By using MS/MS analyses, the generated degradants were further described and effectively isolated. Validation studies showed that the recently developed method is stable and sensitive to all degradants. Validation studies show that within the required operating range, the newly created approach was also linear, accurate, precise, robust, and selective.

Introduction

Chemically speaking, viloxazine is 2-[(2-ethoxyphenoxy) methyl] morpholine, an antidepressant.[1] In Fig. 1, the construction was shown. ADHD, or attention deficit hyperactivity disorder, is treated with it. ADHD is a common neurodevelopmental disorder in children that is characterized by hyperactivity and inattention. An imbalance of neurotransmitters, namely dopamine (DA) and norepinephrine (NE), is the cause of this pathogenesis. It is thought that the medication works by changing the monoaminergic neurotransmitter systems. By attaching to the norepinephrine transporter, it is a moderate and selective norepinephrine reuptake inhibitor that prevents norepinephrine reuptake. As a result, it raises the amounts of extracellular norepinephrine in several brain regions.[2,3] In April 2021, the FDA authorized QELBREE, an extended-release form of viloxazine, for the treatment of ADHD.[4] Major depressive illness was treated with it as an antidepressant prescription. It was believed to be beneficial for both severe depression and mild to moderate depression, whether or not co-morbid symptoms were present.[5]

Material and Methods

Equipment

SAMSKRUTI COLLEGE Kondapur (V) Ghatkesar (M) R.R. Dist. Hyd.

Principal
Samskruti College of Pharmacy
Kondapur (V), Ghatkesar (M),
Medchal Dist. PIN-501301

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Hiptage benghlensis Leaf Extracts' Hypolipidemic Effect on High-Fat Diet-Induced Hyperlipidaemic Rats

G.Rajani [1],Divya [2],Adithyamathur [3],Abdul Karim [4],
Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

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ABSTRACT

The goal of the current research was to assess the hypolipidemic effects of Hiptage benghalensis leaf aqueous extract (HBAE) and ethanolic extract (HBEE) utilizing an animal model of hyperlipidemia caused by a high-fat diet. Male albino wistar rats weighing between 120 and 150 grams were divided into six groups. Rats classified as hyperlipidemic (groups II, III, IV, V, VI, and VII) were fed a high-fat diet in order to induce hyperlipidemia, whereas normal rats (group I) were given a conventional laboratory diet along with 0.3% carboxy methyl cellulose (CMC). Group II, the hyperlipidaemic control group, was given 0.3% CMC (10 mL/kg/day). Group III, the standard group, was given gemfibrozil (50 mg/kg/day, p.o.). Groups IV and V, the HBAE groups, were given an aqueous extract of H. benghalensis (100 and 200 mg/kg/day, p.o.), and groups VI and VII, the HBEE groups, were given an ethanolic extract of H. benghalensis (100 and 200 mg/kg/day, p.o.), all of which were administered in conjunction with a high-fat diet for four weeks in a row. When compared to hyperlipidaemic rats (group II), the HBAE and HBEE treatments resulted in a substantial ($p < 0.05$) reduction in blood lipids (TC, TG, LDL, and VLDL) and rise in cardioprotective HDL. Phytochemical screening identified phytoconstituents that may be responsible for the hypolipidemic effects reported, including alkaloids, flavonoids, saponins, tannins, phenolic compounds, and steroids. According to the results of the current investigation, HBEE (200 mg/kg, p.o.) produced strong hypolipidemic effects.

Introduction

A lipid metabolic illness called hyperlipidemia is characterized by elevated levels of triglycerides (TG) and/or total cholesterol (TC). Furthermore, plasma contains lower amounts of high-density lipoproteins (HDL) and higher levels of low-density lipoproteins (LDL).[1] It is well known that hyperlipidemia, particularly high LDL and low HDL, is a significant risk factor for atherosclerosis and cardiovascular illnesses.[2] Moreover, CVD is one of the leading causes of mortality globally[1]. Treatment for hyperlipidemia and atherosclerosis involves lowering plasma levels of cholesterol and triglycerides. It is necessary to discover a means of preventing and managing hyperlipidemia and associated cardiovascular disorders. The majority of synthetic medications, including fibrates, statins, and others, show promise but may also cause serious adverse effects such myositis, diarrhea, altered lipid function, and increased

SAMSKRUTI COLLEGE OF PHARMACY Kondapur Ghatkesar R.R. Dist.

Principal
Samskruti College of Pharm
Kondapur (V), Ghatkesar (...
Medchal Dist. PIN-501301

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Reduces depression symptoms brought on by long-term stress with Sanggenon C

Shiva Srikrishna [1], Dr.Narasaiah [2], L.Devikamma [3], Bairi Teja [4],

Abstract

The goal of this study is to determine if Sanggenon C alleviates depression in Wistar rats subjected to chronic unexpected mild stress (CUMS).

Methods: A forced swimming test and a sucrose preference experiment were used to evaluate Sanggenon C's anti-depressant impact. Histological investigations were conducted on the cortex and hippocampus using hematoxylin and eosin (H & E) stains, while an open-field test was used to quantify the locomotor change produced by CUMS. To assess cell death, researchers used TUNEL staining, which stands for terminal deoxynucleotidyl transferase dUTP nick end labeling. We also used Western blotting to assess the levels of AMP-activated protein kinase (AMPK) phosphorylation and the expressions of brain-derived neurotrophic factor (BDNF), Bax, Bcl-2, cleaved caspase-3, LC3, Beclin, and P62.

Sanggenon C had a substantial impact on open-field CUMS rats, increasing their preference for sucrose, decreasing their immobility time in the forced swimming test, and increasing the size of the crossing squares and rearing periods ($p < 0.05$).

Nuclear shrinkage and damage in the cortex and hippocampus were both alleviated by sanggenon C. Additionally, Sanggenon C controlled the expression of autophagy-associated molecules (LC3, Beclin, and p62), proteins linked with apoptosis (Bax, Bcl-2, and cleaved caspase-3), and other proteins. There was an increase in BDNF expression and AMPK phosphorylation that Sanggenon C showed.

Results: Sanggenon C activates the AMPK pathway in CUMS rats, which enhances neuroprotection and depressed behavior while inhibiting apoptosis and inducing neuronal autophagy. To completely comprehend the therapeutic importance of Sanggenon C-mediated AMPK activation in various cellular settings as prospective therapeutic targets, more study is necessary.

Apoptosis, Sanggenon C., Depression, Autophagy, and the AMPK pathway

INTRODUCTION

Depression is a widespread neuropsychiatric disorder, and it is implicated in neuronal damage in specific brain regions. The most common pathological characteristics of depression are neuronal damage and apoptosis [1]. It has been reported that increased apoptosis suppresses the renewal of dendritic spines and hinders restoration of normal neuronal function, whereas inhibition of neuronal apoptosis accelerates neuronal regeneration and facilitates recovery of depressive symptoms [2,3]. In addition, brain cell inflammation, oxidative stress, and neuronal autophagy are also causes of depression [4].

Sanggenon C is isolated from the traditional Chinese medicine Morus alba, which is traditionally used for anti-inflammatory, analgesic, and blood stasis-dissipating treatments [5]. Sanggenon C also possesses over pharmacological activity. For example, under hypoxic conditions, sanggenon C reduces pro-inflammatory factors, reactive oxygen species (ROS) and apoptosis. Sanggenon C regulates Ras homolog gene A/Rho-dependent coiled-coil kinases (RhoA/ROCK) signaling to inhibit inflammation and oxidative

Assistant professor [1,2,3,4],

Principal
Samskruti College of Pha
Kondapur (V), Ghatkesar
Medchal Dist. PIN-501301

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The efficacy of valsartan and amlodipine combined in the management of hypertension-related type 2 diabetic mellitus

J.Mahesh [1], L.Devikamma [2], Shiva Srikrishna [3], Barla Shiva [4],

Abstract

The goal of this study is to determine if individuals with hypertension and type 2 diabetes mellitus (T2DM) benefit from taking valsartan and amlodipine together. Methods: Between July 2018 and October 2022, 110 patients who received treatment at North China Electric Power University Hospital in Beijing, China had their medical records reviewed retrospectively. The experimental group (SG; n = 60) took one tablet of co-formulated valsartan (80 mg) and amlodipine (5 mg) daily for six months, in contrast to the control group (CG; n = 50) that took oral amlodipine (5 mg) daily. Insulin and atorvastatin calcium were also prescribed to all patients along with the aforementioned medications. After six months of therapy, researchers evaluated CG and SG based on therapeutic efficacy and side effect occurrence. We evaluated blood pressure indices (diastolic blood pressure, systolic blood pressure) with blood glucose-related indices (glycosylated hemoglobin, fasting blood glucose, and 2 hours postprandial blood glucose). The results indicated that both groups saw a substantial drop in 2 h PG, FBG, HbA1c, SBP, and DBP after treatment compared to the pre-treatment values ($p < 0.05$). However, when comparing SG to CG, the 2 h PG, FBG, HbA1c, SBP, and DBP in SG were considerably lower ($p < 0.05$). Comparison between CG and SG revealed a considerably decreased overall response rate (ORR) ($p < 0.05$). Compared to CG, the incidence of side effects was significantly lower in SG ($p < 0.05$). Conclusion: Treating type 2 diabetes with hypertension simultaneously with valsartan and amlodipine is an effective and safe way to regulate blood sugar and blood pressure. To determine the validity of these results, further experiments are needed. Diabetes mellitus type 2, valsartan, amlodipine, hypertension

INTRODUCTION

Type 2 diabetes mellitus (T2DM), alternatively known as non-insulin-dependent diabetes or maturity-onset diabetes, is a chronic metabolic condition. Different from type 1 diabetes [1], T2DM is typically characterized by decreased responsiveness of the body to insulin [2,3]. It usually develops in middle-aged or elderly people aged 50 – 60 years, but in modern society, young people aged 20 – 45 years may also suffer from this disease [4]. In addition, people with T2DM are often prone to hypertension, which may be related to poor insulin effect caused by T2DM. This may increase the tension of blood vessels and the retention of body fluids, thus leading to hypertension. On the other hand, hypertension may also affect the development and progression of diabetes by affecting the mechanism of blood glucose regulation [5]. The treatment of T2DM complicated by hypertension aims to control the blood glucose

Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

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Improved Solubility and Dissolution of Dolutegravir-Loaded Solid Self-Micro-Emulsifying Drug Delivery System

V.Balamani [1],Soujanyadaniel [2],Manisha [3],Jala Naresh [4],
Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

ABSTRACT

Dolutegravir sodium (DG) is a BCS class II antiretroviral medication that was just licensed. It has a 16% oral bioavailability and a low aqueous solubility. Therefore, the goal of this study was to create a solid self-micro-emulsifying drug delivery system (S-SMEDDS) for dolutegravir in order to improve its solubility and behavior during dissolution. DG's solubility was first examined in order to choose an oil, surfactant, and co-surfactant. To determine the microemulsion zone, a pseudoternary phase diagram was created. Using Campul MCM, Tween 80, and Transcutol P as the oil, surfactant, and co-surfactant, respectively, liquid SMEDDS of DG were created. Using a Box–Behnken factorial design, the effects of various quantities of oil, surfactant, and co-surfactant on particle size, zeta potential, and transmittance percentage were investigated. The resulting liquid SMEDDS was assessed for its viscosity, cloud point, resilience to dilution, globule size, thermodynamic stability, and dye solubilization test. Neusilin US2 was used as a solid carrier in the adsorption process to transform acceptable formulations of liquid SMEDDS into solid form. According to an analysis of S-SMEDDS, the solubility of DG rises from 0.270 to 33.52 mg/mL in S-SMEDDS. S-DG4 demonstrated an in-vitro drug release of 99.86 ± 1.47% within 120 minutes, while ordinary DG demonstrated 32.55 ± 1.52%. Therefore, the research found that S-SMEDDS is a viable strategy to improve the solubility, dissolution, and bioavailability of drugs that are poorly soluble in water, such as DG.

Introduction

One of the biggest problems facing the pharmaceutical business is poor water solubility when it comes to oral medications. Among the most important issues during formulation design and development are poor water solubility and the subsequent dissolving rate of any medicine.[1] Formulation development is severely hampered by the fact that 40–60% of newly created chemical entities with good pharmacological activity that are created using combinatorial selection methods are poorly water-soluble.[2] Drugs of the BCS Class II have poor solubility and high permeability. One of the main physicochemical parameters influencing medication absorption and therapeutic efficacy is solubility and permeability. Therefore, one of the main causes of new drugs not efficiently reaching the market is their low solubility.[2] Dolutegravir (DG) is a member of the HIV integrase inhibitor family of antiretrovirals. Dolutegravir's chemical structure is seen in Fig. 1. It's used to treat HIV-1 infection. On August 13, 2013, the Food and Drug Administration authorized dolutegravir. The HIV-related enzyme integrase is inhibited by dolutegravir. HIV integrates viral DNA into host cell DNA via this enzyme. Thus, inhibiting integrase may lower the body's HIV concentration by halting HIV replication. Antiretrovirals are usually used in conjunction with this medication.It has a minimal risk of negative effects and may lower the viral load. It was offered under the Tivicay brand. Dolutegravir is prescribed at a typical dose of 50 mg once day.[3] Because DG has low solubility and high permeability, it falls into the class II group of drugs under the BCS classification, making it poorly soluble. Oral bioavailability of DG is just 16%. Therefore, in order to enhance oral bioavailability, DG's solubility and dissolution rate must be increased. DG has just 16% oral bioavailability since it falls within the BCS classification's class II category, which denotes poor solubility and high permeability. Therefore, we must increase its solubility in order to enhance its oral bioavailability.[4]

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Development and Improvement of Biodegradable Microspheres Loaded with Fluvastatin Sodium

Soujanyadaniel [1],V.Balamani [2],Bibu Prasad [3],Jala Naresh [4,]
Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

ABSTRACT

By blocking HMG-COA reductase, the hypolipidemic drug fluvastatin sodium lowers the production of cholesterol. Given its limited bioavailability (24–29%) and relatively short biological half-life (1.2 hours), the medication is a good choice for a sustained-release drug delivery method. The objective of this work was to optimize fluvastatin sodium biodegradable microspheres using an experimental design methodology. Fluvastatin sodium microspheres were made by the o/w emulsification solvent evaporation process using a biodegradable polymer called poly (lactic-co-glycolic acid) (PLGA 50:50). To investigate the impact of drug to polymer ratio and stirring speed on dependent variables, such as particle size, entrapment efficiency, Q1h, and t80%, a 32 complete factorial design was used. The prepared formulations underwent evaluations to assess their physicochemical qualities and release features. There was no evidence of a drug-excipient interaction detected by DSC or FTIR. The entrapment effectiveness of microspheres varied from 63.1 to 85.6%, and their size ranged from 193 to 344 µm. Drug release from formulations was seen to be up to 23% in 1 hour and 80% in 3–9 hours.

Introduction

The conventional way of designing and developing dosage forms entails changing one variable at a time, which takes a lot of time and doesn't take into account the cumulative impact of factors. During the creation of pharmaceutical dosage forms, the complex effects of independent variables and their interactions on product attributes may be studied using the design of the experiment technique.Numerous studies have been published that use the design of experiment approach to create dosage forms [1,2].One such tried-and-true method for examining the relative impact of certain individual factors and their interactions on a few crucial pharmaceutical product quality characteristics is the factorial design [3].In terms of patient compliance and clinical effectiveness, sustained release systems have advanced significantly [4].[5] Of the many medication delivery methods, multi-particulate drug delivery systems have become more important.[6,7] By choosing the right formulation factors, the use of multi-particulate-based drug delivery enables careful customization of drug release to the particular location. These methods tend to reduce excessive local drug concentrations and toxicity risks, which results in more uniform drug release across the whole gastrointestinal tract.[8] Creating microspheres using biodegradable polymers is a standard procedure for creating dosage forms with prolonged release.[9] Many medications and biotechnology items have been delivered with controlled release using biodegradable polymers as carriers.[10] Both natural and manufactured biodegradable polymers have more swelling characteristics when they come into contact with an aqueous media, which increases their residence duration. Additionally, they have the ability to break down chemically or enzymatically into biocompatible byproducts. When used as drug delivery systems, biodegradable microspheres offer several benefits over traditional ones. The medication is delivered instantly and loses its impact quickly. Dosing frequency rises as a result.

Because biodegradable microspheres provide continuous medication release over an extended length of time, frequent multiple dosage administration is avoided.[11] The kind and concentration of the polymer determine the speed and volume of medication release from microspheres. The system's main flaw is the biodegradable microspheres' complicated drug-loading efficiency, which makes it challenging to regulate the drug's release.

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Extract from Clematis erecta Inhibits Breast Cancer Cell Migration, Invasion, and Apoptosis

Bibu Prasad [1],Manisha [2],Soujanyadaniel [3],Ikram Hussain [4],
Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

ABSTRACT

One of the main characteristics of breast cancer is the migration and invasion of cancer cells to other regions of the body. The illness gets more difficult to control and cure when cancer cells invade more areas of the body. There are medications that kill cancer cells but also induce general cytotoxicity; no medication has been found to stop cancer cells from spreading. It has already been shown that the natural ingredients have invasive and anticancer potential. Syphilitic, malignant, and other nasty ulcers are historically treated with an infusion of the leaves of Clematis erecta L. (Ranunculaceae). Furthermore, there was notable analgesic and anti-inflammatory effect in the ethyl acetate fraction and methanolic extract. The scientific literature continues to provide no evidence that C. erecta has anticancer properties. Investigating the anticancer effects of C. erecta aerial parts on breast cancer cells was thus planned. The findings indicate that C. erecta may have anti-invasive properties against MDA-MB-231, a kind of triple-negative human breast cancer cell. The effects of three distinct extracts (water, methanol, and chloroform) from the aerial portions of C. erecta on the migration and proliferation of MDA-MB-231 human breast cancer cells were assessed. It's interesting to note that aqueous extract reduces cell growth by over 50% and reduces invasion and migration by 40% and 50%, respectively. Further evidence that C. erecta has the ability to destroy cancer cells came from the fragmentation of DNA in extract-treated cells.

Introduction

As the most common cause of mortality and one of the most complex medical conditions, cancer is a deadly illness.[1] The condition is still difficult to cure even with cutting-edge scientific methods, early diagnosis, therapy, and preventative measures.[2-4] Normal cells may become malignant due to the unchecked proliferation of cancer cells caused by genetic instability and other cell changes.[4] Worldwide, women get the most breast cancer diagnoses out of all cancer types.[5] The capacity of breast cancer cells to penetrate and spread is a hurdle to the disease's identification and therapy.[6,7] Mutations in the genome give cancer cells the capacity to break out from the main tumor site, break down the extracellular matrix (ECM), and infiltrate stromal tissues.These cells then intravasate, travel via vascular or lymphatic pathways, extravasate in distant tissues, and start to self-home in the new location [8, 9].[10–12] Inhibiting metastasis has the ability to lower the disease's fatality since it is a complicated process involving the whole cell apparatus. In order to prevent metastasis by obstructing the components essential to the adhesion, migration, and invasion of cancer cells, scientists are now investigating a wide range of medications and substances.[6,13–15]

It is becoming more well acknowledged that the process of invasion and metastasis offers a wealth of potential targets for the creation of more advanced medications that might function as inhibitors by limiting invasion and metastasis.[16] Studies have shown the chemopreventive properties of phytochemicals found in the human diet, and they have also raised the possibility of bioactive natural substances having anticancer properties.[17–19] Several medications containing anticancer ingredients have been created from natural sources.[20, 21] Scientific research has recently concentrated on the bioactive elements of these substances and their processes for causing cell death.[22–24] Consequently, it seems that natural phytochemicals may be used to stop, slow down, or even cure cancer.

The genus Clematis has garnered significant interest recently due to its anticancer properties.[25–28] Therefore, we chose Clematis erecta for our present research. L. C. erecta is a member of the Ranunculaceae family and is often referred to as upright virgin's bower. Syphilitic, malignant, and other nasty ulcers are historically treated with an

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RP-HPLC Method Development and Validation for Aceclofenac and Piperine Simultaneous Determination in Rat Plasma to Examine Pharmacokinetic Parameters

Manisha [1], Bibu Prasad [2], V.Balamani [3], Habizur Rahman [4],
Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

ABSTRACT

Aceclofenac, a BCS class II drug, is highly metabolized in human hepatocytes and microsomes and is weakly soluble in water. Its oral bioavailability is about 15%, which is rather poor. A naturally occurring bioenhancer, piperine is utilized to boost the oral bioavailability of several pharmaceuticals. The pharmacokinetics of piperine (10 mg/kg) and aceclofenac (20 mg/kg) in combination were examined in this study's rats. In this investigation, piperine was utilized to increase the bioavailability of aceclofenac despite their different chemical and physical characteristics. This was followed by the creation and validation of an HPLC technique to assess their simultaneous measurement in rat plasma. Solid phase extraction was used to prepare the plasma samples before HPLC analysis was performed. The research revealed that the retention times for piperine and aceclofenac were 14.4 minutes and 5.3 minutes, respectively. The linear range of aceclofenac concentration in rat plasma was shown to be between 0.1 and 20 µg/mL. The calculated correlation coefficient (R2) was 0.9995. Cmax rose to 48.52 µg/mL from 23.59. Aceclofenac's oral bioavailability may be increased by including piperine into the formulation.

Introduction

Aceclofenac (NSAID) is one of the most commonly used non-steroidal pain relievers (Fig. 1a). Osteoarthritis and rheumatoid arthritis pain are treated with it. It functions by preventing the production of prostaglandins (PG), an enzyme that causes pain, swelling, inflammatory responses, and a high body temperature.[1–3] The recommended daily dosage of aceclofenac is 200 mg. A regular dose is required because aceclofenac's plasma elimination half-life is approximately 4 hours. When administered orally, about 15% of it was bioavailable. It belongs to the group of BCS Class II medicines. They have a poor bioavailability due to extremely low solubility in biological fluids. Human hepatocytes and microsomes substantially metabolise aceclofenac to produce the main metabolites 4′-hydroxydiclofenac, 4′-hydroxyaceclofenac, and diclofenac. It is likely that CYP2C9 mediates the metabolism of aceclofenac.[4–6] The prospect of increasing solubility and rate of dissolution to boost bioavailability has been researched using a variety of techniques.[7–9]

Increasing medication bioavailability is crucial for therapeutic purposes since it directly impacts plasma concentrations and therapeutic effectiveness. There are numerous ways to boost a drug's bioavailability. The most recent strategy uses bioavailability enhancers based on herbs. Plant-based bio-enhancers include piperine, gingerol, niaziridin, allicin, curcumin, capsaicin, and quercetin, to name a few.[10–12] The black pepper fruit contains piperine (*Fig. 1b*), the first bioenhancer in the world, and a significant plant alkaloid (*Piper longum* and *Piper nigrum*). Through a variety of processes, piperine increases gastrointestinal absorption and decreases medication metabolism in the stomach.[13–17] In a study that compared piperine to commercially available treatments, the bioenhancing effectiveness of piperine in combination with non-steroidal anti-inflammatory medicines was described as clinically relevant at a dosage of 5 to 20 mg/kg.[18] It has been determined that the marketed drug formulation "Risorine®" is bioequivalent to rifampicin preparations sold in pharmacies. It contains the active ingredients rifampicin, isoniazid, and piperine as a bioenhancer. The dosage of rifampicin was reduced from 450 to 200 mg when piperine was added.[19] Many medications have their bioavailability increased by piperine. The optimal bioavailable drug combination with piperine requires substantial research and an appropriate formulation technique. Currently there is no research on the aceclofenac and piperine combination. This study was designed to assess the bioavailability of aceclofenac alone and in combination with piperine.

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Research on Ibrutinib and Quercetin Fixed Dose Combination Self-Nanoemulsifying Drug Delivery Systems in Human Cancer Cell Lines

Tejasree [1],R.Madhulika [2],K.Pavithra [3],Gottimukkul.A.Bharath Reddy [4],
Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

ABSTRACT

Apoptosis induction, angiogenesis suppression, and anti-proliferative effect against numerous human carcinoma cells have been shown by quercetin (QC), whereas ibrutinib (IB) permanently inhibits Bruton's tyrosine kinase, which is important in the tumor microenvironment. Insolubilized oil-based chemicals like quercetin and ibrutinib may be loaded using the self-nano-emulsifying drug delivery system (SNEDDS). IB with QC was combined with SNEDDS in the present investigation, and human lung adenocarcinoma (A549) and malignant melanoma (A-375) cell lines were used to assess cytotoxicity. The optimal loaded formula included PEG-600, Kolliphor® RH 40, and castor oil. Physical parameters were assessed for the improved formulation, and the findings were satisfactory. The MTT assay was used for cytotoxicity investigations on these combinations, and the examined compound's IC50 values were determined. The test chemicals T1 (pure IB + QC) and T2 (IB + QC SNEDDS) have computed IC50 values (μM) of 70.34 ± 0.8 and 85.46 ± 0.93 μM after a 24-hour investigation in the A-549 adenocarcinoma cell line, respectively. The chemicals T1 and T2 have IC50 values of 59.52 ± 0.87 and 88.43 ± 1.03 μM during a 24-hour investigation in the A-375 cancer cell line, respectively. The IC50 of IB-QC loaded SNEDDS was found to be greater than that of pure drug combinations; they enter cells by active transport and cause cytotoxicity. According to the studies' overall findings, IB-QC-loaded SNEDD had synergistic effects that may have had a major impact on the percentage of cell death.

Introduction

In recent years, not only has cancer been recognized as one of the major causes of death worldwide, but its incidence and mortality rate have grown rapidly.[1] The reasons behind that are complex and multifactorial. Still, they reflect the growth and aging of the worldwide population, as well as the increase in the prevalence and distribution of several cancer risk factors.[2] Although, currently, a plethora of studies researching new treatment methods are being conducted, we should also consider other possibilities for repurposing already established medications. As the most widely adopted approach in cancer therapy, chemotherapy is subject to many *in-vitro* and *in-vivo* barriers, such as tumor microenvironment and multidrug resistance (MDR). In particular, during the chemotherapy processes, chronic damage to cells elicits the secretion of damage response program molecules to promote the survival and growth of neighboring cells, thus causing acquired MDR to the chemotherapies.[3] Combination chemotherapy for cancer therapy is considered an important protocol to enhance therapeutic effects and reduce systemic toxicity by simultaneously modulating multiple cell-signaling pathways. In recent years, the combination of chemotherapeutic drugs *via* nanocarriers has emerged as a promising strategy for treating cancer.[4] These co-delivery systems can address the issues of poor solubility and stability associated with such drugs, transport simultaneously both drugs to the target site, release the payloads in a controlled manner and accurate dose, synchronize the drug exposure, maximize the therapeutic efficacy, and reduce the toxicity. Several drug delivery platforms have been explored for the co-delivery of various combinations of drugs, and their efficacy has been tested both *in-vitro* and *in-vivo*.[5]

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Molecular Docking and ADME Study for the Identification of Serotonin Transporter Inhibitors from Selected Marine Alkaloids

R.Madhulika [1], Tejasree [2], K.Sujitha [3], Godala Keshavanath Goud [4],
Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

ABSRTACT

Depression is among the prevalent mental health conditions affecting individuals globally. People of various ages and ethnicities may be affected. Even with depression meds, only few individuals get the best results from them. The negative effects of antidepressants that are now in use include weight gain, nausea, urine retention, cardiovascular problems, etc. The possibility of natural substances as a therapeutic intervention to eliminate these negative effects is being investigated. Metabolites derived from marine species have a variety of advantageous properties. Compounds with magical abilities to treat mental illnesses are found in a variety of sponges, corals, and seaweeds. The molecular docking of the serotonin transporter (SERT) with a few marine alkaloids is shown in this work. Out of thirteen examined alkaloids, only gelliusine A had a greater binding affinity than the recommended antidepressant paroxetine, according to results obtained by the PyRx virtual screening program. The majority of the chosen alkaloids exhibited improved absorption, distribution, metabolism, and excretion (ADME) characteristics, according to SwissADME. However, gelliusine A does not penetrate the blood-brain barrier (BBB) and has a limited rate of gastrointestinal absorption. In order for these molecules to become more effective antidepressants against serotonin reuptake, further experimental research and optimization are required.

Introduction

Depression affects millions of people globally and is the leading cause of disabilities worldwide. People facing chronic diseases, career failure, financial problems, inferiority complex are more prone to depression. Approximately 3.8% of the population, including 5% of adults (6 and 4% in women and men, respectively) and 5.7% of adults aged over 60 have depression. Around 280 million people globally have depression.[1] Mental healthcare and treatment for depression can vary widely across the world due to limited resources, stigma surrounding mental illness, and insufficient training for healthcare providers. According to community surveys carried by WHO World Mental Health Survey Initiative for 12 months, only 36.8% in high-income countries, 22.0% in upper-middle-income countries and 13.7% in lower-middle-income countries received treatment for depression.[2] The Global Burden of Disease (GBD) Study 2019 found that depressive and anxiety disorders are the two most disabling mental disorders and are ranked among the top 25 leading causes of burden worldwide in 2019. For adolescents it ranked among top 10 causes.[3]There are 9,596 studies in ClinicalTrials.gov database under the field of depression, out of which 324 are in active, not recruiting state, 1418 in recruiting state and 5464 are completed.[4] It is now well known that major depressive disorder (MDD) is highly associated with various chronic physical conditions such as cardiovascular disease, diabetes, cancer, chronic respiratory disease and various chronic pain conditions.[5-9] These conditions are of great personal and public health importance and can be considered representative of the costs of depression.[10] It has been seen that chances of depression rises with the rising age. Studies in older adults also suggest that life incidents, especially financial challenges and death of family members are as important triggers of depression as in young people.[11] Patients' attitude and belief is one of the important factors to influence treatment conformance.[12] Different anti-depressants are used to treat depression like monoamine uptake inhibitors, monoamine oxidase inhibitors, atypical anti-depressants and some other classes. These may inhibit the reuptake of monoamines like noradrenaline, serotonin, serotonin and noradrenaline, noradrenaline and dopamine or by inhibiting monoamine oxidase enzyme. Atypical anti-depressants may act in

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Development of the Linezolid Inhaler's Formulation and Assessment Research for the Treatment of Tuberculosis

K.Pavithra [1],G.Pratyusha [2],B.Manasa [3],G.Veeresh [4],
Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

ABSTRACT

This study's main goal was to create and assess a linezolid inhaler. To find out how well linezolid works in the lungs to treat TB, dry powder inhaler liposomes were developed. The liposome's were made using two techniques: physical dispersion and ethanol injection, continuous dosages of medications, and soy lecithin and cholesterol in varying weight ratios. Physical and chemical characteristics of the F9 formulation, including vesicle size, shape, and zeta potential, were described. According to the outcomes of stability tests, in-vitro testing, and physical characterization, liposome's containing linezolid have potential use in the treatment of TB. The batch under evaluation had positive physicochemical characteristics, with excellent entrapment effectiveness (98.8%) and spherical liposome's with a mean size of less than 100 nm. For up to eight hours, the liposomal dry powder inhalers (DPIs) that were created maintained medication release. Ninety days after being stored at room temperature, the stability of liposome's was evaluated. The liposomal formulation exhibited increased stability, a prolonged drug release duration, a stable zeta potential, and high entrapment efficiency. To sum up, liposomal inhalers filled with linezolid were effectively created.

Introduction

The primary goal is the development of a liposomal inhaler for treating tuberculosis by extending the dosage form's release. Another purpose of a drug delivery system is to transport a medicine effectively, especially to the site of action, and achieve increased efficacy while limiting harmful effects when compared to conventional drugs. Tuberculosis is a persistent granulomatous illness that causes significant public health problems in developing countries. Linezolid is an antibiotic prescribed for the treatment of pneumonia. It is also used as a secondary treatment for tuberculosis. It is considered an effective third-line drug for managing multidrug-resistant and extensively drug-resistant TB. Linezolid is a synthetic antibiotic that is an antibacterial oxazolidinone derivative that is active. Linezolid works by inhibiting bacterial protein synthesis, thereby preventing the growth and spread of bacteria.[1,2] When a drug is administered into the body, it undergoes several chemical and metabolic changes that reduce its availability at its final site of action in the body. The choice of route of drug delivery is vastly dependent on drug properties, disease states, site of action, and patient compliance. For example, when a drug is administered orally, it has to pass through the digestive system before it reaches the bloodstream. During this process, some of the drugs may be metabolized by the liver or excreted, reducing the amount of drug available for therapeutic effects. On the other hand, when a drug is administered through the pulmonary route, it bypasses the digestive system and directly enters the bloodstream through the lungs. This allows for faster absorption and higher bioavailability of the drug.[3] DPIs are favored delivery devices for inhalation therapy due to their higher stability, lack of propellants, and ease of use. Well-designed dry powder inhalers are highly efficient drug-delivery systems. Inhalation powders, also known as DPIs, are made up of a combination of active pharmaceutical ingredients (APIs) and a carrier; all formulation components are in a finely split solid state and are packaged in an appropriate container closure system. The dry powder inhaler approach provides various advantages, including improved liposomal formulation stability.[4] Liposome's are colloidal, bilayered, micro-spherical vesicles having an aqueous core surrounded by phospholipids molecules (Fig. 1). Liposome's are useful dosage forms for pulmonary medication delivery because they may solubilize poorly soluble medicines, making them aerosol-friendly. Because of their

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The role of mta2 expression in bladder cancer cells and its regulation mechanism

Dr.K.Nagarsee [1], Dr.Nadeem [2], G.Rajani [3], Aszad Hussain Barbhuyan [4],
Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

Abstract

Researching the role of the mta2 gene in bladder cancer and its possible therapeutic applications is the goal of this research.Methods: The T24 bladder cancer cells were transfected with a viral vector to induce overexpression of the metastasis-associated gene 2 (mta2), whereas the EJ bladder cancer cells were transfected with si-mta2. Under the two mta2 expression settings, cell lines were tested for their invasiveness and migratory capability in vitro using Matrigel and Transwell methods, respectively.End result: Data from transwell migration experiments showed that T24 bladder cancer cell lines were much more able to migrate when mta2 protein was overexpressed, but EJ cell lines were much less able to migrate when mta2 was knocked down ($p < 0.01$). In the matrigel invasion experiment, it was shown that the invasive capability of the T24 bladder cancer cell line was greatly increased by overexpressing the mta2 protein, whereas the invasive capacity of the EJ bladder cancer cell line was dramatically decreased ($p < 0.01$) by knocking down mta2. In the T24 bladder cancer cell line, which overexpresses mta2, the levels of E-cadherin and N-cadherin were lower than in the cd511b-transfected and untransfected groups, respectively. In addition, compared to cells that were transfected with si-NC or not transfected, the E-cadherin protein expression in the EJ bladder cancer cell line with mta2 knockdown was noticeably greater ($p < 0.01$).In conclusion, mta2 knockdown blocks bladder cancer cell lines' ability to proliferate, migrate, and invade by preventing proteins involved in the epithelial-mesenchymal transition from doing their jobs.Reproductive process, migration, bladder cancer, mta2

INTRODUCTION

The most frequently diagnosed tumor of the urinary tract is bladder carcinoma which is usually located on the mucosal surface and ranks amongst the 10 most-often diagnosed human neoplasms [1]. The age of onset of bladder cancer is relatively broad: it occurs almost at any given age, even in children. However, the occurrence of bladder cancer slowly rises as a function of age. There have been increases in incidence of bladder cancer in recent times, due to factors such as heightened use of sundry chemical products, tobacco use, and aging human populations [2]. At present, radical surgery and adjuvant treatment are used to mitigate the signs of bladder carcinoma, but studies have revealed that postoperative bladder cancer patients still experience high degrees of local recurrence, distant metastasis and poor prognosis [3]. The etiology of bladder cancer is complex. Two clear risk factors are exposure to aromatic amines and smoking, but little is known about some unpredictable biological behaviors within the cancer tissue or signaling routes associated with its progression [4]. Therefore, in order to efficiently carry out timely diagnosis and treatment of bladder tumor patients, there is need to identify new molecular markers for evaluation of its prognosis.

Some investigations have revealed that *mta2*, one of the Metastasis-Associated Genes (MTAs), is up-regulated in ovarian cancer, hepatocellular carcinoma, bladder cancer and other malignant tumors, and is intimately linked to cancer cell migratory and invasive potential[5]. However, the number of reports on relative expression of *mta2* in bladder carcinoma, and its role, is limited. Thus, this research was aimed at determining *mta2* expression in bladder carcinoma cells, as well as the influence of *mta2* overexpression and *mta2* silencing on their multiplication, invasiveness and migratory potential. This was to identify the relevance of *mta2*, and its possible regulatory mechanism in the progression of bladder carcinoma.

EXPERIMENTAL

Materials

Chongqing Youbao Biotechnology Co. Ltd was the supplier of bladder cancer cell lines (24, EJand J82), *mta2* interference lentivirus and plasmid required.

Handling of cells

The bladder cancer cells were maintained in RPMI

Principal
Samskruti College of Pharmacy
Kondapur (V), Ghatkesar (M)
Medchal Dist. PIN-501301

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Impact of pycnogenol on oxidative and inflammatory damage in rat ovaries caused by ischemia/reperfusion

Dr.Y.Sirisha [1], Dr.Aneela [2],Shivaprasad [3],Asraful hoque [4],
Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

Abstract

The goal of this biochemical and histological study was to determine if pycnogenol (PYC) protected rats' ovaries from the ischemia/reperfusion (I/R) damage that resulted from experimental ovarian torsion.Methods: The six rats were divided into four equal groups and given the following names: SG (sham), PCG (pycnogenol 40 mg/kg), IRG (ovarian ischemia-reperfusion), and PIR (pycnogenol 40 mg/kg plus ovarian ischemia-reperfusion). The right ovary was made to undergo ischemia for two hours using vascular clips in the groups that received IRG and PYC treatments. Two hours after induction of ischemia, the ovary was reperfused. Next, the levels of MDA, tGSH, NF-κB, TNF-α, and IL-1β in the rat ovarian tissues were reviewed. Follicle counts were also conducted in addition to histological examinations of ovarian tissues.The outcomes are: The developing follicles in the ovary of the I/R-induced group exhibited morphological and cellular deterioration as well as vascular disease, according to the histopathological investigation. Compared to the I/R-induced group, the PYC therapy group exhibited significantly reduced ovarian injury, edema, and vascular pathology ($p < 0.05$). Compared to the SG group, the I/R-induced group had considerably greater levels of MDA, NF-κB, TNF-α, and IL-1β, whereas the I/R damage group had significantly lower levels of tGSH ($p < 0.05$). Treatment with pycnogenol corrected the alterations in these biochemical indicators and the histological changes caused by I/R.Pycnogenol protects rat ovaries against I/R-induced alterations in biochemical markers and histological disturbances, as shown in the conclusion. If we want to know how PYC affects ovarian damage, we need further research, preferably on people.

Key terms: ischemia-reperfusion, ovarian injury, pycnogenol, malondialdelnyde, tumor necrosis factor-alpha, interleukin-1β.

INTRODUCTION

Ovarian torsion occurs when the ovary rotates around its ligaments from which it receives support [1]. It is a gynecological emergency and affect women of all ages [2]. The most important risk factors are: being of reproductive age, presence of a mass in the ovaries exceeding 5 cm, pregnancy, ovulation induction and previous ovarian torsion [3]. However, ovarian torsion is seen even in normal ovaries [4]. Ovarian torsion is one of the causes of ovarian ischemia [2]. Ischemia is a condition in which the amount of oxygen in the tissue is reduced as a result of impaired blood flow in the vessels associated with the tissue, for whatever reason. On the other hand, reperfusion is the restoration of blood supply to the ischemic tissues [5]. Continuous reperfusion, after an ischemic attack, leads to a new physio-pathological process called "reperfusion injury", which results in more severe tissue damage [6]. A delay in diagnosing and treating ovarian torsion result in severe ovarian damage and infertility [7]. Therefore, in the clinical setting, reperfusion of the ovaries by detorsion of the torsioned ovaries and preservation of their functions should be prioritized. Xanthine oxidase, the levels of which increase in tissue during ischemia, converts hypoxanthine to xanthine, using the abundant oxygen available as the tissue reperfuses [5]. As a result, a large proportion of the oxygen that reaches the tissue during reperfusion is converted into reactive oxygen species (ROS). Products with toxic properties, such as malondialdehyde (MDA), are formed due to the attack of cell membrane lipids by ROS [5]. In a study conducted by Ali and coworkers, it was reported that

SAMSKRUTI COLLEGE OF PHARMACY Kondapur (V) Ghatkesar (M) R.R. Dist.

Principal
Samskruti College of Pharmacy
Kondapur (V), Ghatkesar (M)
Medchal Dist. PIN-501301

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Impact of NLRP3 inhibition and micro-ribonucleic acid-22 up-regulation on malignant melanoma cell survival

D.VenkataramanDra [1], Dr.D.Suryadevarakonda [2], DivyaAlia Sahithi [3],
Assistant professor [1,2,3],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

Abstract

The goal of this study is to identify the mechanisms by which the up-regulation of miR-22 targeting NLRP3 alters the proliferation and invasiveness of malignant melanoma cells and the effects on these metrics. Amelomas grown in mice Thawing, sub-cultivation, and transfection were performed on B16 cells. various transfections were used to assign cells to various groups (A1–A5). For example, A1 cells were transfected with a miR-22 mimic overexpression, A2 cells with a miR-22 inhibitor, A3 cells with a miR-22 mimic+siNLRP3 transfection, A4 cells with a miR-22 mimic NC sequence transfection, and A5 cells without transfection. The results showed that miR-22 expression was increased in the A1 group compared to the A2, A3, A4, and A5 groups, but decreased in the A3, A4, and A5 groups. A1 had considerably lower levels of NLRP3 mRNA and protein compared to other groups, but A2 had significantly higher levels compared to A3, A4, and A5 ($p < 0.05$). In comparison to groups A3, A4, and A5, the A2 group showed a considerable increase in cell proliferation and colony formation rate, while groups A1 showed a marked decrease. Reducing the incidence and development of malignant melanoma is achieved by targeting NLRP3 suppression by up-regulating miR-22 expression level. This greatly decreases the proliferation, invasiveness, and matrix metalloproteinase levels of melanoma B16 cells. Insightful reference data for gene-level therapy of malignant melanoma is provided by the findings. Macular melanoma, micro-ribonucleic acid-22, NLRP3 inflammasome, cell invasion capacity, cell transfection

INTRODUCTION

Malignant melanoma refers to cancerous transformation of the corresponding pigmented nevus. Due to the morphological changes in nevus cells, the tumor formed is called melanoma [1,2]. The etiology of melanoma is very complex. The most common risk parameters are environmental factors (sunlight exposure and chemical stimulation), genetic factors and immunological factors [3]. Melanoma is a highly malignant tumor that occurs mostly in the skin, but also in the mucous membranes and internal organs, and it accounts for about 3% of all tumors [4,5]. There has been a rise in fatality associated with this tumor in the past 12 years.

Studies show that there are about 150,000 new melanoma cases and about 50,000 melanoma-related deaths worldwide every year [6-8]. Melanoma is very malignant, and it is liable to blood and lymphatic metastasis, and it has a high mortality. Timely surgical resection when there is no metastasis may prolong the survival time of patients by 3 - 5 years. Once malignant melanoma undergoes distant metastasis to multiple organs, it may likely lead to organ failure and death, and the prognosis is poor [9,10]. Therefore, early diagnosis and timely and reasonable treatment are essential.

Surgery remains the primary and definitive treatment for early-stage melanoma, but it is rarely curative for advanced-stage melanoma [11]. In recent years, the applications of immuno- and targeted treatments have prolonged patients' lives and revolutionized the management of this neoplasm [12]. Unfortunately, many subjects develop resistance to targeted medications after several months, and studies suggest that micro-ribonucleic acid plays a key role in the development of drug insensitivity [13,14]. The miRNAs are a class of evolutionarily conserved, non

Principal
Samskruti College of Pharmacy
Kondapur (V), Ghatkesar (M)
Medchal Dist. PIN-501301

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For the treatment of dry eyes caused by the suppression of the JAK2/STAT3 pathway, a combination of Runmu fengye tang preparation and hydroxysugar glycolic acid eye drops is recommended.

Dr.P.Aravinda Reddy [1], Dr.V.Ravikumar [2],Dr.Rafia [3],Aashish r hajare [4],
Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

Abstract

The goal of this study is to identify therapeutic approaches that successfully address dry eye in clinical settings.

Methods: Eye drops containing glycerol, dextran 70, and Runmu Fengliang tang (RMFS) were given to rabbits in a model of scopolamine-induced dry eye (HGA). Dry eye symptoms and lacrimal gland damage were assessed using Schirmer's I test (SIt), break-up time (BUT), and histopathologic exams (H&E). Apoptotic cell count and Th17/Treg percentages were determined by flow cytometry, and JAK2/STAT3 pathway protein expression was assessed by Western blot test. Findings: In the rabbit scopolamine-induced dry eye model, the combination of RMFS with HGA considerably enhanced tear production ($p < 0.001$), decreased tear break-up time ($p < 0.001$), restored ocular surface damage, and decreased apoptosis ($p < 0.05$) as compared to the group that received just one injection of the medication. Furthermore, it suppressed the JAK2/SATA3 pathway and controlled the balance of cytokines associated to Th17 and Tregs. In conclusion, scopolamine-induced dry eye symptoms are alleviated in rabbit models when RMFS and HGA are administered together, suggesting that this medication may be useful in the treatment of dry eye illness. Collecting clinical data to examine the combination's effectiveness and safety should be the focus of future investigations. Topics covered include: hypromellose 2910, runmu fengliang tang, glycerol eye drops, the th17/treg and JAK2/SATA3 pathways, and dry eye syndrome.

INTRODUCTION

Dry eye disease (DED) is a multifactorial ocular surface disease characterized by tear film homeostasis, ocular surface inflammatory response and damage, and ocular discomfort [1]. The reported prevalence of DED ranges from 5 to 34 %, with a higher prevalence in women and older adults [2,3]. In recent years, with the changes in the living environment and the extensive use of video terminals, the incidence of dry eye disease is increasing year by year and there is a trend of rejuvenation [4]. The DED is often associated with symptoms such as itching, foreign body sensation and burning sensation in both eyes, which reduce the quality of life of affected individuals. The chronic inflammatory state involved in DE lead to vision loss or blindness, if not treated promptly with appropriate therapies. However, treatment of DED is difficult and effective treatments are still lacking. Thus, an investigation into effective drugs required for the prevention and treatment of dry eye is a key scientific task that needs to be done, as it will have practical and effective implications on the patients and therapeutics in general. In recent years, the study of immunomodulation has gained increasing attention and researchers have found that regulatory T cells (Treg) and the helper T cell subset 17 cells (Th17) play a very important role in immune-inflammatory diseases [5]. It has been shown that the development of dry eye disease is significantly associated with disturbed Treg/Th17 cell homeostasis and that blocking IL-17 *in vivo* significantly reduces the severity and progression of the disease by restoring the Treg Th17 cell ratio [6]. Therefore, protection of

Samskruti College of Pharmacy (M) Ghatkesar Dist. Hyd (V) Kondapur
Samskruti College of Pharmacy
Kondapur (V), Ghatkesar (M), Medchal Dist. PIN-501301

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By inhibiting NLRP3 inflammasome via autophagy activation, carnosol improves sevoflurane-induced cognitive impairment in old rats.

Dr.V.Ravikumar [1], Dr.P.Aravinda Reddy [2],Shilpadas [3], Ashaful alom [4],
Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

Abstract:

Specifically, we want to learn how carnosol works and how it affects postoperative cognitive dysfunction (POCD). Methods: The sevoflurane (SEV) paradigm of cognitive impairment in rats was developed. We used a dihydroethidium (DHE) test to measure the impact of carnosol on ROS levels in rats that had been produced by sevoflurane. The impact of carnosol on mitochondrial damage was evaluated using adenosine triphosphate (ATP) generation and immunoblot tests. Cognitive impairment in the rats was assessed by a water maze experiment. The immunoblot test was used to evaluate the action mechanism. The results showed that carnosol inhibited ROS generation and mitochondrial damage caused by sevoflurane in rats, and it also triggered autophagy. Carnosol also inhibited SEV-induced cognitive impairment via activating autophagy and SEV-induced NLRP3 inflammasome activation, respectively. Conclusion: Carnosol, by inhibiting the NLRP3 inflammasome, improves SEV-stimulated cognitive impairment and may one day be used as a treatment for cognitive impairment. Carnosol, Sevoflurane (SEV), NLRP3 inflammasome, and autophagy are some of the terms used to describe this phenomenon.

INTRODUCTION

Postoperative cognitive dysfunction (POCD) is a type of complication with long-term consequences, defined as impaired memory, attention and information processing that occurs after anesthesia [1]. Studies show that about 10 % of surgery patients as well as 40 % of older patients over the age of 65 develop POCD [2]. Compared to patients without POCD, patients with POCD have significantly higher mortality rates and higher dependence on social security [3]. Despite extensive research efforts, the pathogenesis of POCD remains unknown [4]. New therapeutic agents still need to be developed to treat POCD. Rosemary (Salvia rosmarinus) is a Mediterranean plant that is now widely available in several countries [5,6]. Rosemary extract can be used to treat inflammation-related diseases [7]. Carnosol is a phenolic diterpenoid which exists in rosemary extract and has been shown to have anti-inflammatory and antioxidant effects [8]. Carnosol treatment inhibited the eosinophils in the bronchoalveolar lavage fluid of mice after ovalbumin treatment [9]. Previous studies have shown that carnosol alleviates sevofluranestimulated cognitive dysfunction in aged rats via NF-κB pathway. It also causes the activation of autophagy in breast cancer [8]. However, the potential effect and mechanism of action of the compound on POCD remains unknown. There is growing evidence of a causal relationship between SEV-stimulated cognitive impairment and NLRP3 inflammasome [10]. In response to cellular stress, NLRP3 recruits ASC as well as pro-caspase-1, which causes the cleaved caspase-1 to activate and process the maturation of IL-1β and IL-18 [11]. NF-κB is involved in the control of many cellular processes [11]. The activation of NF-κB family is a key step in regulating pyroptosis. However,

SAMSKRUTI COLLEGE OF PHARMACY Kondapur (V) Ghatkesar (M) R.R. Dist. Hyd.

Principal
Samskruti College of P
Kondapur (V), Ghatke
Medchal Dist. PIN-501

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Analyzing the potential effects of small compounds involving MSR1 and C6-ceramide on nasopharyngeal cancer using GSEA

Dr.D.Suryadevarakonda [1], D.Venkataraman Dra [2], Shazia [3], Andol Rajesh kumar [4],
Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

Abstract

The goal of this study is to identify therapeutic drugs and targets that may be useful in the treatment of nasopharyngeal cancer (NPC).A combination of bioinformatics and in vitro experimental validation led to the identification of many candidate treatment drugs and NPC target genes. We found 344 differentially expressed genes (DGEs) that were downregulated and 26 that were upregulated after analyzing three datasets of NPC patients. We used KEGG pathway analysis on the DGEs and Gene Ontology (GO) to compile their descriptions. The identification of C6-ceramide as a small molecule with significant significance to NPC was made possible by independently acquiring 316 drug and small molecule target genes from the SEA database. Then, in order to get macrophage scavenger receptor 1 (MSR1), the genes that were differentially elevated were intersected with genes that may be targets of C6-ceramide small molecules. Lastly, the findings confirmed that MSR1 and C6-ceramide may play important roles in NPC cell lines.The outcomes are: The viability of NPC cells was dramatically reduced when MSR1 expressions were knocked down. A substantial decrease in NPC cell viability ($p < 0.0001$) was also seen after treatment with 10 μmol/L C6-ceramide. Moreover, the overexpression of MSR1 in NPC cells was accompanied by an increase in MSR1 levels, which was reduced by C6-ceramide ($p < 0.0001$). At the same time as MSR1 overexpression increased levels of AKT and PI3K, MSR1 knockdown lowered their expression.In conclusion, MSR1 controls PI3K and AKT expression to affect NPC cell survival.Furthermore, C6-ceramide regulates MSR1 expression to have a therapeutic impact on NPC. These results provide fresh avenues for research into the treatment of NPC and novel approaches to its clinical management. These findings provide support for investigating ceramides and MSR1 further as potential new targets in NPC.The PI3K/AKT pathway, cell viability, macrophage scavenger receptor 1, and nasopharyngeal cancer are all related terms.

INTRODUCTION

The nasopharyngeal mucosa can develop a malignant epithelial tumor called a nasopharyngeal carcinoma (NPC), which is common in southern China and Southeast Asia. Unlike other cancers, NPC cells easily spread to lymph nodes and other regions even in the early stages of tumorigenesis [1]. The curative value of current treatments, such as radiation, chemotherapy and molecular targeted therapy, is limited, as evidenced by the high rates of recurrence, metastasis and mortality in NPC patients [2]. Thus, developing appropriate molecular targets for NPC therapy is essential. Macrophage scavenger receptor 1 (MSR1), also known as class A scavenger receptor (SR-A) and cluster of differentiation 204 (CD204) [3], is primarily produced in macrophages. Its functions include scavenging and modifying lipoproteins. The adhesion and phagocytosis of macrophages are related to MSR1 [4]. The MSR1 is a marker of M2 tumor-associated macrophages, which promotes the development and metastasis of tumor. The MSR1 is also a prognostic biomarker for glioma (LGG), uveal melanoma (UVM), lung squamous cell carcinoma (LUSC) and other tumor types [5], but the function of MSR1 in NPC is not clear. In addition, MSR1, as a membrane receptor, binds to ligands to activate signaling pathways including mitogen-

Kondapur (V) Ghatkesar (M) R. Dist. Hyd.

Principal
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M),
Medchal Dist. PIN-501301

Abstract

Goal: Examine if modified Park's approach works well for strabismus patients' kids.
Methods: From January 2019 to December 2021, a total of 120 patients were recruited at the Anhui Provincial Children's Hospital in Anhui, China, in the Department of Ophthalmology. Each of the two groups—the study and the control—contained sixty patients. The research group underwent a modified Park's approach, which featured an intermuscular membrane incision and a conjunctiva two-layer suture method, whereas the control group got rectus muscle adjustment suture using a normal incision. Numerous factors were evaluated, including patient satisfaction, tear film performance, and perioperative indications.
Findings: There was a substantial reduction in intraoperative blood loss, surgical time, and hospital stay for the study group ($p < 0.01$). Additionally, it had a substantially lower corneal staining score ($p < 0.01$), a significantly greater Schirmer's time, and a tear film break-up time (TFBUT) time. The study group's satisfaction level was much greater than the control group's ($p < 0.05$). Clinical effectiveness was also higher (91.67%) than in the control group (83.33%). Furthermore, compared to the control group (11; $p < 0.05$), the study group showed a considerably decreased incidence of complications (5).
In conclusion, enhanced Park's approach results in excellent effectiveness and a decreased incidence of problems while also improving perioperative indicators, tear film function, and satisfaction level. This implies that it might be a good alternative to the standard care given to kids with exotropia. However, in order to prove that this treatment approach is better, long-term follow-up data will be needed.
Keywords: conjunctiva, two-layer suture, intramuscular membrane, Park's method, and strabismus

INTRODUCTION

Strabismus, characterized by misaligned extra ocular muscles, can result in a deviation in eye position. It is a relatively common condition among adolescents, with a prevalence of around 4 %. Treatment of strabismus is time-consuming and often leads to psychological stress for both patients and their families [1,2]. Surgical correction is currently the main approach, but it carries the risk of complications such as corneal exposure and surface damage, which may affect tear film function and impact surgical outcomes and patient satisfaction [3,4]. As a result, safeguarding the cornea during surgery and reducing postoperative complications have become key priorities in clinical practice. In recent years, rectus recession has emerged as a preferred surgical option for strabismus treatment. It offers advantages such as shorter operation time, improved visual field during surgery, and fewer postoperative side effects [5]. However, this technique is not without issues, including eyelid scarring and conjunctival wounds [6]. In comparison, modified Park's technique has gained popularity in strabismus surgery due to its smaller conjunctival incisions, reduced postoperative discomfort, and minimal aesthetic impact [7]. In

Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

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Impact of tinidazole gargle and dentong Xiaoyanling on gingival sulcus factor, dental health, and periodontal metrics in chronic periodontitis

P.Chandrashekar [1],K.Anand Kumar [2],E.Samantha [3],Korada Ramya [4],

Abstract

The goal is to find out how intense tinidazole gargles in addition to Dentong Xiaoyanling affect patients with chronic periodontitis.

Techniques: Ninety-six (96) patients with chronic periodontitis who were admitted to Chun'an County Traditional Chinese Hospital in Qiandaohu Town, China between January 2021 and December 2022 were split into two groups at random: the study group received Dentong Xiaoyanling in addition to concentrated tinidazole gargle treatment, while the control group received the same treatment. The two groups' clinical efficacy, adverse responses, oral health status, gingival sulcus factor (GSF), and periodontal markers were compared.

Results: Before treatment, there were no significant differences ($p > 0.05$) between the two groups' periodontal markers, GSF, or oral health score. However, the periodontal markers, GSF, and oral health score of the two groups substantially decreased ($p < 0.05$) after therapy with Dentong Xiaoyanling and/or concentrated tinidazole gargle, with the study group seeing more dramatic reductions. The group that received treatment with a combination of Dentong Xiaoyanling and concentrated tinidazole gargle had a considerably greater ($p < 0.05$) level of clinical effectiveness (91.67%) compared to the control group (75%). Additionally, there was no discernible difference in the two groups' incidence of adverse events before and after therapy ($p > 0.05$).

In summary, treating chronic periodontitis with a concentrated tinidazole gargle combined with Dentong Xiaoyanling reduces gum inflammation locally, speeds up symptom relief, and increases dental health. Further methodologies will need an expanded sample size from a variety of clinical contexts to validate the efficacy of this technique.

INTRODUCTION

Chronic periodontitis (CP) is one of the most common infectious illnesses in clinical dentistry with patients typically infected with various periodontal pathogenic bacteria [1]. Although there is no uniform standard for treating chronic periodontitis at the moment, treatment principle emphasizes the management and removal of dental plaque, calculus and other pathogenic irritants, effectively decreasing gingival inflammation [2]. Drug therapy, comprising anti-inflammatory and antibacterial drugs, is the primary treatment for chronic periodontitis. Commonly used anti-inflammatory drugs are non-steroidal pharmaceuticals, while anti-bacterial drugs commonly used are nitroimidazoles and macrolides [3]. Single-drug therapy has a far from perfect clinical outcome, thus treating patients with a combination of Western and Chinese medicine has emerged as one of the major foci of clinical research [4]. Tinidazole rinse concentrate is a broad-spectrum antibacterial agent. Its antibacterial activity is achieved by preventing the formation of harmful bacterium DNA. Associated local inflammatory response will be decreased at any time once the patient's local pathogenic germs are under control and clinical symptoms will noticeably improve. Primary constituents of *Dentong Xiaoyanling* include *gypsum, mustard gypsum, Qing dai, Angelica Dahurica, Fang Feng,* and others. Its clinical effects include carbuncle clearance, as well as pain alleviation, which is critical in the etiology of dental disorders such as chronic periodontitis and gum inflammation. Therefore, this research investigates the efficacy of the combination of tinidazole gargle and *Dengtong Xiaoyanling* for the treatment of chronic periodontitis.

Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

SAMSKRUTI COLLEGE OF PHARMACY
Kondapur (V)
Ghatkesar (M)
R.R. Dist. Hyd.

Abstract

The aim of this study is to examine the impact of administering bronchodilators in conjunction with respiratory treatment on the health behavior, psychological state, and pulmonary function of individuals suffering from Chronic Obstructive Pulmonary Disease (COPD).
Method: Between January 2021 and January 2023, 90 COPD patients were treated at the First People's Hospital in Fuyang, Hangzhou, China. This data was analyzed retrospectively. Three groups of patients were assigned: 26 patients received budegopher, 28 patients received symbicor, and 36 patients received both budegopher and respiratory care in combination. Lung function, psychological status (as measured by the Health Behavior Scale (HPL), the Self-Rating Depression Scale (SDS), and the Self-Rating Anxiety Scale (SAS) were noted.
Results: Following therapy, there were notable variations in the three groups' forced vital capacity (FVC) and forced expiratory volume in one second (FEV1). The symbicor group outperformed the budegopher group in terms of outcomes, while the combination group outperformed both the budegopher and symbicor groups in terms of improvement ($p < 0.001$). Group differences were found in pairwise comparisons of health behavior (HPL) and psychological state (SAS and SDS). There were modest positive relationships between health-promoting activities (HPL) and lung function indicators (FEV1, FVC) and negative connections with unfavorable psychological attitudes (SAS, SDS). Health-promoting activities (HPL) and negative psychological attitudes (SAS, SDS) had a somewhat unfavorable correlation.
In summary: Bronchodilator therapy in conjunction with respiratory treatment has significant promise in improving lung function, reducing depressive symptoms, encouraging healthy lifestyle choices, and hastening the recuperation of COPD patients. Nonetheless, there can be minute differences in the medicinal effects of various medications, necessitating further research.
Keywords: COPD, respiratory treatment, Symbicor, Budegopher, negative attitude, and healthy conduct

INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) has emerged as a prominent focus in clinical research, driven by rising incidence attributed to factors such as air pollution, tobacco consumption, and aging population [1]. Limited efficacy of singular drug interventions in COPD treatment has prompted concerns over increased burden on the lungs of affected individuals [2,3]. Consequently, the integration of respiratory care has become imperative. Symbicor, a bronchodilator employed in COPD management, comprises two components, budesonide and formoterol, known for their capacity to relax bronchial smooth muscle and enhance ventilatory function [4,5]. Additionally, budegopher has demonstrated efficacy in controlling disease progression and improving lung function in COPD patients. Nevertheless, the practice of combining respiratory care with bronchodilators in clinical treatment of COPD remains uncommon. This study therefore aims to investigate the impact of combined respiratory nursing and bronchodilator therapy on lung function, psychological well-being, and health behavior of COPD patients.

METHODS

General information

Ninety patients diagnosed with COPD and treated at The First People's Hospital of Fuyang, Hangzhou, China between January 2021 and January 2023 constituted the study cohort. Patients were categorized into three groups based on treatment modalities: budegopher group (26 cases, administered with budegopher), symbicor group (28 cases, subjected to symbicor treatment), and combination group (36 cases, receiving a combined

Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

Abstract

The goal of this study is to determine how perioperative whole-quality nursing care affects patients having painless gastrointestinal endoscopy in terms of their psychological state, vital signs, and anesthetic medication. It also serves as a guide for lowering risks and enhancing painless GI endoscopy safety.

Methods: Cochrane Library, Web of Science, Embase, Pubmed, and other databases were retrieved. Based on predetermined criteria, literature was chosen, and quality assessments were carried out to retrieve the necessary data. In the end, 13 publications were included in the meta-analysis of pertinent data.

Results: Patients receiving high-quality perioperative nursing care showed significant improvements in self-reported anxiety and depression levels, as well as in vital signs indicators like systolic and diastolic blood pressure, mean arterial pressure, and heart rate. They also experienced a decrease in the dosage of narcotic drugs. This was based on a meta-analysis of 13 relevant randomized controlled trials (RCTs). Both the diagnosis and treatment times were considerably shortened ($p < 0.05$). Furthermore, there was a decrease in the occurrence of respiratory depression ($p < 0.00001$).

In summary, our meta-analysis indicates that providing patients with painless gastrointestinal endoscopies with perioperative high-quality nursing care might decrease psychological stress, minimize the need for anesthetic, and expedite the endoscopic process.

Keywords: Anesthesia, painless gastrointestinal endoscopy, perioperative whole-quality nursing, Systematic review and meta-analysis

INTRODUCTION

Digestive endoscopy is a major method used to diagnose digestive tract diseases in recent years [1,2]. Because, painless gastroscopy combined with enteroscopy has a painless feeling, only one anesthetic is needed for two kinds of examinations. Pathological conditions of stomach and colon are obtained once through gastroscopy, which reduces pain and other discomfort of examinees [3,4]. Painless gastroscopy has gradually played a significant role in clinical practice. However, because most examinees do not understand basic knowledge and precautions about painless gastroscopy, (which is an invasive examination method), it leads to psychological stress reaction, restlessness, anxiety, and even fear [5]. It also promotes physical stress reaction of examinee. Two kinds of stress reactions affect and interact with each other, which aggravates their compound stress reaction. At the same time, negative emotions such as anxiety seriously affect examination and recovery [6,7]. Painless gastroscopy takes a long time to operate and is needed to inject more anesthetic drugs, resulting in a high incidence of respiratory depression in patients [8].

During perioperative period, high-quality nursing should be implemented, and basic situation of the patient before examination should be understood, key points for attention explained, one-to-one psychological counseling be conducted, and a friendly nurse-patient relationship should be established, which lays a firm

Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

SAMSKRUTI COLLEGE OF PHARMACY
Kondapur (V)
Ghatkesar (M)
R.R. Dist. Hyd.

Principal
Samskruti College of
Kondapur (V), Ghat
Medchal Dist. PIN-501301

Abstract

The goal is to compare the effectiveness of two antibacterial therapies in orthopedic surgery.

Techniques: Based on the postoperative antibiotics used to prevent infection, 96 patients who had orthopedic surgery from January 2021 to December 2022 in the Suzhou Hospital of Integrated Traditional Chinese and Western Medicine, Suzhou, China, were retrospectively analyzed and split equally into two groups. Cefazolin sodium was administered to the study group and amoxicillin sodium/clavulanate potassium was given to the control group. A comparison was made between the two groups for the incidence of postoperative infection, pain score, inflammatory variables, and quality of life.

Findings: Compared to the control group, the study group saw a decreased incidence of postoperative infection ($p < 0.05$). The visual analogue scale (VAS) scores of the two groups were identical ($p > 0.05$) before to the intervention, but they substantially reduced ($p < 0.05$) after it, with the former group's score being lower than the latter ($p < 0.05$). The levels of inflammatory factors in both groups were the same before the intervention ($p > 0.05$); after the intervention, the levels substantially decreased in both groups ($p < 0.05$), with the study group's levels being lower than those in the control group ($p < 0.05$). Following the intervention, the quality of life ratings increased for both groups ($p < 0.05$), with the study group scoring higher than the control group ($p < 0.05$).

In summary: After orthopedic surgery, cefazolin sodium is superior than amoxicillin sodium/clavulanate potassium in avoiding infection in orthopedic patients. To verify these results, however, this therapy approach must be expanded to more clinical settings.

Keywords: Orthopedic surgery, quality of life, inflammatory variables, amoxicillin sodium/clavulanate potassium, cefazolin sodium, and antibacterial infection

INTRODUCTION

As a result of economic and social advances, the number of patients with orthopedic diseases has been rising in recent years [1]. Compared with other types of operations, orthopedic surgery is more complicated and are of longer duration. Patients are prone to incision infection after surgery due to extensive intraoperative bleeding and decreased body immunity [2]. Postoperative incision infection in orthopedic patients may cause bone defects or non-union, affecting treatment efficacy as well as prognosis of patients. Hence, it is necessary to actively prevent postoperative infection in orthopedic surgery [3]. Currently, antibacterial drug prophylaxis is mainly given half an hour before or after orthopedic surgery in clinical practice [4]. Cefazolin sodium has a wide antibacterial spectrum, and effectively inhibits staphylococci, *Streptococcus pneumoniae*, Klebsiella, *Enterobacter aerogenes* as well as *Escherichia coli*. Moreover, the drug has a long half-life [5]. Amoxicillin sodium/clavulanate potassium, also a common antibacterial drug, is a compound preparation composed of clavulanic acid and amoxicillin, and is effective against infections caused by enzyme-producing resistant bacteria [6]. The aim of this study was to determine the comparative prophylactic effect of two antibacterial therapies in orthopedic surgery.

Assistant professor [1,2,3,4],

Department of Pharmacy,

Samskruti College of Pharmacy,

Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

Abstract

For the purpose of treating corneal ulcers, a combination of 1 part Anchomonas difformis, 1 part Cyrtrospherma senegalense, and 2 parts Pycanthus angolensis has been proposed. In accordance with claims made in traditional medicine, this research will assess the phytochemical components, antibacterial activity, and efficacy of a combination of these exudates in treating corneal ulcers. The method included collecting fresh exudates in separate containers. After they were dried off, the phytochemical components of each residue were examined. We further investigated the antibacterial properties of P. angolensis exudates by studying their impact on rabbits with chemically produced ocular ulcers. The results showed that the exudates of A. angolensis and C. senegalensis contained only reducing sugars. Tannins, flavonoids, and reducing sugars were the bioactive components found in P. angolensis exudates. Additionally, this demonstrated antibacterial action against the tested species. Within ten days of therapy, it cured the corneal ulcers in rabbits that had been caused by NaOH. In conclusion, the corneal ulcers in rabbits were cured by the exudates of P.angolensis, which included bioactive components and showed antibacterial activity. Even without A. angolensis and C. senegalensis exudates, its traditional usage for healing corneal ulcers seems reasonable.

Important terms: rabbits, Pycanthus angolensis, ocular ulcers, exudates.

INTRODUCTION

Pycanthus angolenses Welw Warb (Myristicaceae) is also known as "African nutmeg or false nutmeg"1 The Nigerian Local names of the plant are, Abakang (Ibibio) Akwa mili (Ibo) Abora (Itsekiri), Akamo, Akujaadi (Yoruba), Nupe (Kpokgi), and Abaororo (Urhobo). Others are: Etena (Cameroon), and Loioka (Zaire)1 It is a forest tree of about 30.5 m high 2.45 m in girth. The bark is grey, longitudinally fissured, flaking in patches in old trees and exudes reddish coloured juice. It is widely used for ethnomedical purposes2 An infusion of the bark is reported to be effective in the treatment of leprosy3 and for purification of breast milk in Guinea. A terpenoid quinine with potential use in treatment of Type 2 diabetes was isolated from the plant4 Herbal medicine practioners in some parts of Delta State, Nigeria, claim that a 1: 1: 2 mixture of exudates of *Anchomones difformis: Cyrtosperma senegalense:* and *Pycanthus angolensis* respectively is used for treatment of corneal ulcers. (Personal communication with Tega Ikuegbvweha, the second-named author). This work was done to verify this claim.

Assistant professor [1,2,3],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

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Esculin's Antioxidant Effect on Lead Acetate-Induced Neurotoxicity in the C57BL/6 Mice's Hippocampus and Cortex

Hanumanthu [1],S.Umarani [2],K.Anand Kumar [3],K.Ganesh [4],

ABSTARCT

Lead exposure to heavy metals is linked to significant neuronal damage due to reactive oxygen species-mediated oxidative stress. This research examined esculin's possible neuroprotective effects on the C57bl/6 model of lead (Pb)-induced brain damage. The experiment included four groups of mice: control, lead acetate-treated (10 mg/kg), lead acetate plus esculin (10 mg/kg + 15 mg/kg), and esculin (15 mg/kg) treated alone for 14 days in a row. Brain homogenates were subjected to lead-induced changes in lipid peroxidation, nitric oxide, protein carbonyl, and enzymatic and non-enzymatic activity levels. Examined were histological alterations in the cortex and hippocampal regions. The findings showed that PbAc dramatically reduced glutathione content, superoxide dismutase, catalase, glutathione peroxidase, and glutathione reducase activity while increasing hippocampus and cortical lipid peroxidation and nitrite levels. In the hippocampus and cortex, histological examinations of lead-induced neurotoxicity showed significant damage and a decrease in neuronal density. However, by reestablishing the equilibrium between antioxidants and oxidants and improving motor coordination and memory function, esculin therapy protected hippocampal and cortical neurons against PbAc-induced neurotoxicity. Additionally, esculin reduces the amount of neuronal density and morphological damage in the C57bl/6 mice's cortex and hippocampus. Therefore, the findings implies that esculin could be helpful in preventing neuronal damage caused by lead acetate.

Introduction

The term "neurotoxicity" describes the changes in neurophysiology that result from exposure to dangerous chemicals. These changes might result in mood swings, memory issues, cognitive decline, or the start of mental illnesses.[1-3] Various heavy metals, medications, organophosphates, microorganisms, and animal neurotoxins are among the most prevalent toxicants.[4] One of the most common heavy metal exposures that may significantly harm an animal's or human's neurobehavioral and functional performance is lead. Pb has been linked to oxidative stress and interactions with the antioxidant defense system, both of which increase the risk of oxidative damage to brain systems, according to research.[5] Lead's capacity to bind to sulfur-containing groups in cysteine molecules connected to antioxidant enzymes results in conformational changes that make the enzymes inactive, which is the mechanism behind lead neurotoxicity.These conditions make the cell very susceptible and may result in cell death or apoptosis [6]. Pb may block a variety of enzymes because of its strong affinity for a number of essential functional groups, including amino, carboxyl, and sulfhydryl groups.[7] They include superoxide dismutase (SOD), catalase,

Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India

SAMSKRUTI COLLEGE OF PHARMACY Kondapur (V) Ghatkesar (M) R.R. Dist. Hyd.

Principal
Samskruti College of Pharmacy
Kondapur (V), Ghatkesar
Medchal Dist. PIN-501301

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Detection of 3-4 Methylenedioxy amphetamine from Drug Abuser's Fingers and Toenails using Liquid Chromatography with Mass Spectroscopy

G.Pratyusha [1],K.Pavithra [2],B.Krishnakrishn [3],Fulchand Talukdar [4,]

ABSTRACT

Nails have the ability to steadily collect chemicals over long periods of time, which may provide information about past drug usage and misuse. Drug analysis in human nail clippings has shown its important use in recent years for therapeutic drug monitoring, detection of drug exposure in utero, forensic toxicological applications, and program monitoring. Compared to traditional matrices (blood and urine), nails provide a number of benefits, such as an extended detection window (months to years), non-invasive sample collection, and ease of storage and transit. Because of these features, nails play a crucial role in therapeutic drug monitoring and forensic toxicology. Due to the low levels of medicines and drug addiction in nails as well as the intricate keratinized matrix, more sensitive analytical procedures are required, and sample preparation is essential. The current work aims to provide a high-performance, straightforward approach for the detection and measurement of 3,4-methylenedioxyamphetamine (MDA) in fingernail and toenail clippings using liquid chromatography-mass spectroscopy (LC-MS). Six patients receiving therapy at a rehab facility in Ujjain, Madhya Pradesh, India, had finger and toenail clippings taken. After decontaminating the nail clippings, they were hydrolyzed in 1 M NaOH at 370°C, extracted using ethyl acetate, diluted with methanol, and finally analyzed using LC-MS. Using the MDA reference standard, the calibration curve was created spanning the concentration range of 0.5 to 30 ng/mL.

Introduction

3,4-methylenedioxymetham-phetamine, or MDMA, is one of the most widely misused substances in the world. It is sometimes referred to as molly or ecstasy. This artificial material was initially created in 1912 as a raw material for hemostatic medicines. Its inception year serves as the source of its roots. Chemically speaking, the substance known as N-methyl-3,4-methylenedioxyamphetamine or 3,4-methylenedioxy-methamphetamine MDMA is known by its common or "street" name, ecstasy. [1-3] MDMA is readily absorbed from the digestive system and reaches its maximal plasma concentration around two hours after oral intake, according to Mass et al.[4] and Verebey et al. [5]. With the metabolic intermediates 3,4-dihydroxyamphetamine HHA and 3,4- hypo ethylating agents HMA, the principal metabolites of MDMA are 3,4-methylenedioxyamphetamine (MDA), 4-hydroxy-3-methamphetamine (HMMA), and 4-hydroxy-3 methoxyamphetamine (HMA).[5–9] MDA's structure is shown in Figure 1. and the breakdown of MDMA into MDA, HMMA, and HMA, as seen in Figure 2. In recent years, there has been an increase in the number of crimes that have been made easier by the use of illegal drugs, according to the National Crime Record Bureau (NCRB, India). Numerous cases—including methamphetamine-related ones—have been reported in accordance with the NDPS Act. Occasionally, instances

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Shilpadas et. al International Journal of Pharmacetical Sciences Letters

Evaluation of Swietenia macrophylla King's (Meliaceae) Seed's Antidiarrheal Activity in Vivo

Shilpadas [1],Shazia [2],G.Rajan [3],Mojahidul Islam [4],
Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

Abstract

Objective: Traditional medicine uses the seeds of Swietenia macrophylla to alleviate diarrhea. To support a folktale, the anti-diarrhea effect of petroleum ether extract from Swietenia macrophylla (Meliaceae) seeds was studied in Wister albino rats.
Methods: In castor oil-induced diarrhea, the anti-diarrheal efficacy of petroleum ether extract of this plant's seeds was evaluated at graded dosages (25, 50, and 100 mg/kg body weight) based on the decrease in the rate of defecation and the consistency of faeces. Its impact was further assessed on intestinal transit and castor oil-induced intestinal fluid buildup (enteropolling) in order to comprehend the mechanism of its antidiarrheal action.
Results: The extract exhibited exceptional antidiarrheal efficacy at different dosages (25, 50, and 100 mg/kg body weight), as demonstrated by a decrease in the pace of defecation and a decrease in the consistency of faeces.
The outcomes are similar to those of diphenoxylate, a common medication (50 mg/kg body weight). Diarrhea severity was significantly reduced after taking 100 mg/kg body weight of Swietenia macrophylla extract orally once. The extract strongly blocked enteropooling generated by castor oil and created a dramatic reduction in intestinal transit (4.45 - 34.60%). These effects were equivalent to those of intraperitoneal injections of standard medicine atropine sulphate at dosages of 0.1 mg/kg body weight and 3 mg/kg body weight, respectively.
In conclusion: According to experimental results, Swietenia macrophylla seed petroleum ether extract has strong anti-diarrheal properties and might one day be a powerful source of anti-diarrheal medication.
Key words: atropine sulfate, castor oil, anti-diarrheal action, and Swietenia macrophylla.

INTRODUCTION

Wet stool, increased frequency of bowel movements, and abdominal discomfort are the hallmarks of diarrhea. 1. It is now the world's biggest cause of malnutrition and mortality among children in underdeveloped nations; 2. Despite several attempts by governments and international organizations to contain the illness, the annual incidence rate remains high at around 7.1 million.

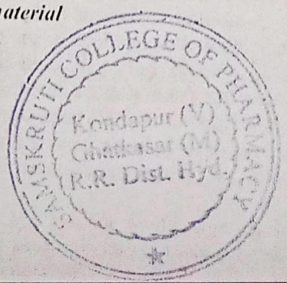
3. There are several synthetic medicines available for the treatment of diarrhea, such as diphenoxylate,loperamide, and antibiotics, but they come with certain adverse effects. Natural medications are utilized as antidiarrheal medications, albeit they don't necessarily have no side effects. 4. As a result, one of the major areas of ongoing research has been the hunt for safer and more effective agents. Based on traditional medicine, diarrhea has long been treated orally using a variety of medicinal herbs or their preparations.

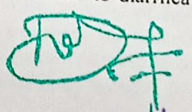
Swietenia macrophylla, a gorgeous, tall, evergreen tree in the Meliaceae family, is indigenous to tropical

America, Mexico, and South America. It typically reaches heights of 30 to 40 meters and widths of 3 to 4 meters. 5. Swietenia macrophylla seed has been shown to have anti-inflammatory, antimutagenecity, and antitumor properties 6. Swietenine, swietenolide 7, swietemahonin, khayasin, andirobin, augustineolide, 7-deacetoxy-7-oxogedunin, 6-deoxy swietenine, proceranolide, 6-O-acetyl swietonolide, and 2-hydroxy swietenine have been isolated from the seeds of this plant 8. Local healers in East Midnapore, West Bengal, India, have traditionally used Swietenia macrophylla seed to treat diarrhea. The goal of the current research was to assess the antidiarrheal potential of a petroleum ether extract of Swetenia macrophylla seeds in rats that were both normally acclimated to diarrhea and those that were induced by castor oil.

MATERIALS AND METHODS

Plant material





Principal
Samskruti College of Phar
Kondapur (V), Ghatkesar (M
Medchal Dist. PIN-501301

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Assessment of Baicalein-Loaded Hydrogel for Diabetic Wound Healing Management

K.Sujitha [1],N.Rajashekar [2],G.Pratyusha [3],Dodda Neelima [4].

ABSTRACT

The goal of the current research was to thoroughly investigate the in-vivo wound healing impact of produced baicalein (BCA) loaded hydrogel and compare the results with the commercial formulation. In a prior investigation, prepared hydrogels were previously described and optimized. Glycol chitosan gellan gum polymers were used to create baicalein-loaded hydrogel (GG-GC-HGs). Rats with diabetes wound models (induced by streptozotocin) were used to assess the wound-healing potential of prepared hydrogels. Measurements of wound contraction and biochemical analyses (Hydroxyproline, protein content, and antioxidant test) in the treated wound tissue were used to assess the impact of wound healing. Hematological analysis of the tissue from the wound was done. The study's findings demonstrated that after 10 days of therapy, the percentage of wound contraction in the animal group treated with baicalein loaded GG-GC-HGs decreased significantly ($p < 0.05$), and on day 18, the wounds fully healed. Treatment of baicalein-loaded GG-GC-HGs resulted in a considerable increase in hydroxyproline and protein content; the findings were equivalent to those of the animal reference group (Hydroheal Gel). Following treatment with BCA-loaded GG-GC-HGs, antioxidant status was recovered. These findings were corroborated by histological examination of the wound tissues. In conclusion, baicalein-loaded hydrogel significantly improved diabetic wound healing by promoting fibroblast proliferation, enhancing epithelialization, and lowering oxidative stress.

Introduction

Hydrogels are hydrophilic in nature because of contains some specific hydrophilic functional group (eg. hydroxy. amide and hydrogen sulfite) in the gel form. The presence of polymeric substance in the hydrogel is responsible for greater absorption efficacy. Food and biomaterial scientists refer to polymeric cross-linked network structures as gels or hydrogels interchangeably.[1] Cross linking in hydrogels avoids their crushing during swelling.

Softness, swelling, absorbent property, elasticity, flexibility, and the ability to store water are among the crucial characteristics of hydrogels.[2] As Hydrogels are known for having greater absorption capacity with water that is unique, simulating biological tissue when swollen; since hydrogels characteristics mimic to the real tissues, that's by they have good biocompatibility. and looks like natural living tissue.[3,4] The localized and continuous release of a medicine was discovered to be made easier by hydrogels since they require fewer administrations, don't cause damage, and allow for slightly smaller doses.[3]Hydrogels resemble living tissue when swelled and distended because they have low interfacial tension with water and other biological fluids. This characteristic has been successfully applied in the field of tissue engineering. The gel's elastomeric nature also helps lessen mechanical friction between tissues. Because they are non-toxic. biocompatible. biodegradable, readily available, and able to alter the characteristics of an aqueous environment as well as thicken, emulsify, stabilize, encapsulate, and swell as well as form gel films, natural polymers, particularly polysaccharides, have been used to make hydrogel.[5]

Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

SAMSKRUTI COLLEGE OF PHARMACY Kondapur (V) Ghatkesar (M) R.R. Dist. Hyd.

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Principal
Samskruti College of Pharmacy
Kondapur (V), Ghatkesar (M)
Medchal Dist. PIN-501301

ABSTRACT

Using acetone, ethyl acetate, and ethanol as solvents, the goal of the current research was to examine the anthelmintic potential of the Amaranthus tricolor Linn plant, which belongs to the Amaranthaceae family. The phytochemical components of the extracts were tested, and their vermicidal efficacy against adult Eisenia fetida earthworms was assessed. Comparatively speaking, phytochemicals were present in all of the extracts. The majority of the phytochemicals were present in the acetone extract, but the ethanol extract had less of them. In the bioassay, different concentrations (10–30 mg/mL) of each extract were examined, and the earthworms' paralysis and eventual death were tracked. Normal saline was used as the control group and albendazole as the reference standard. Every extract showed greater potency than the reference medication and dose-dependent anthelmintic action in both the measures (paralysis and death). The most promising result was the acetone extract (30 mg/mL), which paralyzed worms in 5 minutes and killed them in 13 minutes. The result implies that the A. tricolor Linn plant's acetone extract could be helpful as an anthelmintic. The current research provides scientific proof for the traditional use of this leafy vegetable as a vermicide and indicates that the leaves of the A. tricolor Linn plant are a good source of active chemicals with anthelmintic action. According to the early phytochemical study, the remarkable vermicidal activity of acetone extract may be attributed to the substantial presence of glycosidic and phenolic compounds in it.

Introduction

The prevalence of gastrointestinal helminthiasis infection by parasites such as hookworms and tapeworms is one of the notable health hazards, affecting 1.5 billion people worldwide.[1,2] The worm infection causes serious health conditions of anemia, diarrhea, vomiting, loss of appetite, acidity, and under nourishment, and leading to serious morbidity by affecting a large population.[3] As per the World Health Organization and pharmacologists, only a few drugs such as albendazole, mebendazole, benzimidazoles, piperazine, diethylcarbamazine citrate, ivermectin, and levamisole are used in the treatment of helminthiasis in human being.[2,4] These synthetic drugs show undesirable side effects, often become resistant to parasites, and are non-affordable by many poor people.[5]The inadequate availability of effective allopathic medicinal drugs, their adverse side effects, and the increasing resistance of gastrointestinal parasites towards synthetic anthelmintics create a problem in treating and managing this disease. Considering the facts, it is the need of the hour to develop an effective and alternative strategy against gastrointestinal helminths.

Anthelmintics from natural medicinal plant sources can provide an efficient and eco-friendly alternative to commercially available drugs. Anthelmintic plants, also known as vermifuges or vermicides, are used traditionally to expel the parasitic worms from the body either by causing distress or demise to the worms. Also, it was found that the leaf extract of a variety of medicinal plants shows anthelmintic properties when compared to other parts of the medicinal plant.[6] The plants of the Amaranthaceae family, such as *Amaranthus tricolor L.*

Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

ABSTRACT

Within the class of flavonoids, myricetin is regarded as a flavonol. Recent studies have shown that myricetin may treat diabetes, cancer, and heart disease in diverse ways. There have been claims that myricetin is an antioxidant that is stronger than quercetin. The current research looked at how myricetin-loaded nanoemulsion (MYCT-NE) gel formulation affected diabetic animals' ability to repair wounds. The impact of myricetin-loaded nanoemulsion on diabetic wound healing was assessed using wound contraction measurement, hydroxyproline estimate, protein estimation, antioxidant test, and histological examination. The nanoemulsion gel was created using carbopol 934. A shorter length of epithelialization was seen on day 18 of therapy, indicating that the MYCT-NE gel treated groups had faster wound healing as compared to the control group. enhanced hydroxyproline levels in MYCT-NE gel-treated tissue demonstrated enhanced collagen turnover, which accelerated the healing of wounds. After therapy and healing, the wound tissues' levels of catalase, glutathione, and superoxide dismutase (SOD), GSH, and other antioxidants are restored by MYCT-NE gel, demonstrating its potent antioxidant action. The findings demonstrated that the wound treated with MYCT-NE gel and the reference group without edema and congestion demonstrated effective original tissue regeneration. The current study's findings suggest that MYCT-NE gel reduces oxidative state in experimental animals, which speeds up the healing of cutaneous diabetic wounds.

Introduction

A chronic wound often results in tissue damage that is accompanied by inflammation, oxidative stress caused by the production of free radicals, lipid peroxidation, and the inactivation of enzymes. Several causes, including diabetes, infection, or metabolic abnormalities, might cause a wound to fail to heal.[1] Different therapeutic modalities have been researched in both clinical and experimental settings to speed up wound healing.[2]Numerous variables that lead to thickening of the basement membrane of the capillaries and arterioles hinder wound healing in diabetics. It frequently happens in people with diabetes, impairing wound healing and causing forceful ulcer development.[3] The creation of advanced glycation end products, which trigger the release of inflammatory molecules (TNF, IL-1), and interfere with collagen synthesis, have been found to have a detrimental influence on wound healing.[4] High glucose levels also affect cellular shape, granulation tissue's lack of collagen, keratinocytes' aberrant differentiation and decreased proliferation.[3] However, the risk of major side effects or the disadvantage of the drug's early inactivation might accompany administering medications for treating wounds via oral and parenteral routes.[5]

Clear, thermodynamically stable, isotropic mixtures of oil, water, and a surfactant/cosurfactant combination are referred to as NEs.[6] After topical administration, lipophilic medicines often concentrate in the uppermost layers of the skin. According to recent studies, lipophilic medicines included into NEs effectively enter the skin. NEs can increase the local or systemic distribution of a medicine through a variety of ways when used as topical vehicles.[7] First, compared to other traditional topical formulations like ointments, creams, gels, and lotions, their composition

Assistant professor [1,2,3,4],
Department of Pharmacy,Samskruti College of PharmacyKondapur (V),
Ghatkesar (M) Medchal Dist, Telangana, India.

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V.Raju et. al International Journal of Pharmacetical Sciences Letters

Indian medicinal herbs' antimicrobial properties against germs that cause acne

V.Raju [1],G.Ratnakumari [2],Vijayalakshmi [3],Matta Ruthwik [4,]
Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

Abstract

It has been shown that Propionibacterium acnes and Staphylococcus epidermidis are the pus-forming bacteria that cause acne inflammation. The goal of the current research was to assess the antibacterial properties of Indian medicinal herbs against various acne vulgaris causal factors. Disc diffusion and broth dilution methods were used to test the antimicrobial activities of ethanolic extracts of Hemidesmus indicus (roots), Eclipta alba (fruits), Coscinium fenestratum (stems), Curcubito pepo (seeds), Tephrosia purpurea (roots), Mentha piperita (leaves), Pongamia pinnata (seeds), Symplocos racemosa (barks), Euphorbia hirta (roots), Tinospora cordyfolia (roots), Thespesia populnea (roots), and Jasminum officinale (flowers). According to the disc diffusion technique findings, seven medicinal herbs have the ability to stop Propionibacterium acnes from growing. Strong inhibitory effects were seen in Hemidesmus indicus, Coscinium fenestratum, Tephrosia purpurea, Euphorbia hirta, Symplocos racemosa, Curcubito pepo, and Eclipta alba. The extract from Coscinium fenestratum had the strongest antibacterial activity when tested using a broth dilution technique. The MBC values against Propionibacterium acnes and Staphylococcus epidermidis were 0.165 and 0.049 mg/ml, respectively, whereas the MIC values for both bacterial species were the same at 0.049 mg/ml.

INTRODUCTION

The most prevalent skin condition in the pilosebaceous unit is acne vulgaris. This affects the face, back, and trunk, which are the regions with the biggest oil glands1. Seborrhea, comedones, inflammatory lesions, Propionibacterium acnes, Staphylococcus epidermidis, and Malassezia furfur in the follicular canal, as well as sebum production 2, are the common characteristics. It has been stated that Propionibacterium acnes is an obligatory anaerobic bacteria. Its capacity to activate complements and convert sebaceous triglycerides into fatty acids, which neutrophils are drawn to, has been linked to the development of inflammatory acne. Conversely, the anaerobic bacteria Staphylococcus epidermidis often causes superficial infections in the sebaceous unit3. These elements provide a possible therapeutic target.

Antiacne medications target Propionibacterium acnes and Staphylococcus epidermidis4, 5. Due to increased antibiotic resistance, long-term usage of antibiotics to treat acne is no longer recommended.6, Antibiotic resistance arises from a complex interplay between several elements, such as the kind of bacteria-antibiotic association, the way antibiotics are administered, host features, and environmental conditions. Many studies have been conducted on medicinal plants as potential alternative therapies for illnesses in an effort to address the issue of antibiotic resistance. Twelve medicinal plants that have historically been employed as antimicrobial and anti-inflammatory agents were tested in this research for their ability to inhibit Propionibacterium acnes and Staphylococcus epidermidis, two common bacteria that cause acne inflammation.

MATERIALS AND METHODS

Plant material

SAMSKRUTI COLLEGE OF PHARMACY
Kondapur (V)
Ghatkesar (M)
R. R. Dist. Hyd.

Principal
Samskruti College of Pharm...
Kondapur (V), Ghatkesar (...
Medchal Dist. PIN-501301

Abstract

Objective: To study the effectiveness of a modified version of Park's approach in treating strabismus in youngsters. The study's methodology included recruiting 120 patients from the ophthalmology department of the Anhui Provincial Children's Hospital in Anhui, China, from January 2019 through December 2021. Each group of patients consisted of 60 individuals; the research group and the control group were similarly structured. A regular incision was used to modify the rectus muscles in the control group, whereas a modified version of Park's approach including an intermuscular membrane incision and a conjunctiva two-layer suture procedure was used in the experimental group. Patient satisfaction, tear film function, and perioperative signs were among the many characteristics that were evaluated. The results showed that there was a substantial decrease in intraoperative blood loss, operation time, and length of hospital stay in the study group ($p < 0.01$). In addition, there was a marked decrease in corneal staining score ($p < 0.01$), a substantially longer Schirmer's time, and a significantly longer tear film break-up time (TFBUT) time. The study group reported a considerably greater degree of satisfaction than the control group ($p < 0.05$). Also much higher than the control group was clinical effectiveness (91.67% vs. 83.33%). In addition, there was a statistically significant difference in the incidence of complications between the study group (five) and the control group (eleven; $p < 0.05$). Results show that Enhanced Park's approach has a number of positive effects, including an increase in satisfaction, a decrease in problems, and an improvement in perioperative indicators and tear film function. This provides hope that it could one day replace more traditional methods of treating exotropia in youngsters. The effectiveness of this therapeutic approach, however, can only be determined using data collected over an extended period of time. Topics covered include strabismus, the two-layer suture, conjunctiva, intermuscular membrane, and Park's method.

INTRODUCTION

Strabismus, characterized by misaligned extraocular muscles, can result in a deviation in eye position. It is a relatively common condition among adolescents, with a prevalence of around 4 %. Treatment of strabismus is time-consuming and often leads to psychological stress for both patients and their families [1,2]. Surgical correction is currently the main approach, but it carries the risk of complications such as corneal exposure and surface damage, which may affect tear film function and impact surgical outcomes and patient satisfaction [3,4]. As a result, safeguarding the cornea during surgery and reducing postoperative complications have become key priorities in clinical practice.

In recent years, rectus recession has emerged as a preferred surgical option for strabismus treatment. It offers advantages such as shorter operation time, improved visual field during surgery, and fewer postoperative side effects [5]. However, this technique is not without issues, including eyelid scarring and conjunctival wounds [6]. In comparison, modified Park's technique has gained popularity in strabismus surgery due to its smaller conjunctival incisions, reduced postoperative discomfort, and minimal aesthetic impact [7].

Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

SAMSKRUTI COLLEGE OF PHARMACY
Kondapur (V)
Ghatkesar (M)
R.R. Dist. Hyd.

This article can be downloaded from http://www.iajpb.com/currentissue.php

Principal
Samskruti College of Pharmacy
Kondapur (V), Ghatkesar (M)
Medchal Dist. PIN-501301

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Shazia et. al International Journal of Pharmacetical Sciences Letters

Antimicrobial Resistance in Staphylococcus aureus Isolates Occurring in a Community in Zaria, Nigeria, from Healthy Women

Shazia [1],Shilpadas [2],Divya [3],MD.Shakil Ansar [4,]
Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

Abstract

Aiming to provide a framework for empirical antimicrobial therapy based on urine samples, this study examined the antimicrobial susceptibility patterns of Staphylococcus aureus isolated from healthy women to 10 routinely used antimicrobial medications. The method included utilizing normal microbiological methods to grow and screen samples taken from healthy women volunteers in Zaria for S. aureus. To find out how resistant the isolates were to antibiotics, the disc diffusion method was used. Out of 150 urine samples, 54 (or 36% of the total) were found to be S. aureus. Of the 54 isolates, 16 (29.6%), 15 (27.8%), and 23 (42.6%) belonged to pregnant women, unmarried women, and married but not pregnant, respectively. In both the married and single groups, the isolates were very sensitive to gentamicin, ofloxacin, pefloxacin, sparfloxacin, and ciprofloxacin. No statistically significant differences were seen between the two groups for any of the antimicrobial medicines that were evaluated (p>0.05). Of the isolates examined, 34 (63% of the total) shown resistance to several medicines, whereas only 6 (11% of the total) were sensitive to all of the antibiotics. Conclusion: This finding highlights the need to take action to decrease the abundance of bacteria and other microbes that are resistant to antibiotics in otherwise healthy populations.

The following terms are used to describe this study: antimicrobial medicines, Staphylococcus aureus, healthy women, community-associated, susceptibility.

INTRODUCTION

Staphylococcus aureus is a worldwide pathogen with its natural reservoir in human. It is one of the most common causes of severe community associated infections of skin and soft tissue1, 2. Treatment of serious *S. aureus* infections can be challenging, and the associated mortality rate remains 20% to 25% despite the availability of highly active antimicrobial drugs 3. *S. aureus* colonises the nares, axillae, vagina and damaged skin surfaces. About 30% to 50% of healthy adults are colonised with 10 to 20% persistently colonised 4. Approximately 60% of women harbour this organism intermittently at one or more body sites 5. Studies have shown that 7-25% of women harbour toxin-producing *S. aureus* 6. Persons colonised with *S. aureus* strains are at
increased risk of becoming infected with these strains 1, 7 . In the early 1950s, penicillinase-producing strains were universally present in hospital while community-associated isolates of *S. aureus* were considered to be largely penicillin susceptible. However, over the past few years, community-associated *S. aureus* infections are not only resistant to penicillin but to all other β- lactam antibiotics 8, 9 . More so, it is known that epidemic strains of *S. aureus* are commonly resistant to many antimicrobial drugs thereby making the choice of appropriate therapy difficult.

We hereby report the antimicrobial susceptibility pattern of community associated *S. aureus* isolated from healthy women in Zaria community as guide for empirical antimicrobial treatment and a basis for their reduction in healthy communities. This is relevant since resistance is believed to be a common phenomenon among strains of this organism, which is a likely result of
indiscriminate use of antimicrobial drugs, a common occurrence in most Nigerian communities.

SAMSKRUTI COLLEGE OF PHARMACY
Kondapur (V)
Ghatkesar (M)
R.R. Dist, Hyd.

Principal
Samskruti College of Pharmacy
Kondapur (V), Ghatkesar (M),
Medchal Dist. PIN-501301

ABSTRACT

The current study's objective was to look into the early screening of aerial Corchorus olitorius extracts for their ability to reduce inflammation and mend wounds in laboratory animals. Through serial solvent extraction, many extracts including the appropriate solvents—petroleum ether, chloroform, ethyl acetate, ethanol, and aqueous extracts of C. olitorius—were produced. Mice with Xylene-induced ear edema were used to screen all extracts for anti-inflammatory activity, and an incision wound model was used to examine the extracts' ability to cure wounds. The anti-inflammatory impact was found by weighing the ear lobes and using biochemical tests, nitric oxide (NO) levels, and MPO in the tissue sample. Tensile strength measurements and analyses of the protein and hydroxyproline levels in the repaired tissues were used to quantify the impact of wound healing. The current study's observations supported the finding that mice's ear edema was significantly ($p<0.05$) inhibited by C. olitorius ethanol extract (EECO). The mice treated with EECO showed a considerable reduction in both NO and MPO activity. Significant improvements in the tensile strength, protein content, and hydroxyproline level of the repaired tissue of the mice treated with EECO demonstrated the wound healing ability of the tissue. In conclusion, it was shown that the ethanol extract of C. olitorius exhibited the greatest anti-inflammatory efficacy by reducing both NO and MPO activity as well as the ability of experimental animals to repair wounds.

Introduction

Healing of any wound is a dynamic, complex process. The individual's fluctuating health status causes changes in the wound environment. Knowing the fundamental concepts of wound healing can be framed by knowing the physiology of the typical wound healing pathway throughout the phases of hemostasis, inflammation, granulation, and maturation.[1] The quantity of inflammatory cells in the wound reduces during the proliferative phase. Fibroblasts, endothelial cells, and keratinocytes release additional growth factors necessary to mediate wound-healing. Inflammation is now recognized as a type of nonspecific immune response.[2] Vascular and cellular alterations are the two main categories for inflammation's main ingredients. Vascular changes include a rise in blood flow, temporary constriction of blood vessels, and temporary dilatation of arterioles and venules; a rise in permeability causes the release of chemical mediators, swelling, and a rise in viscosity. Leukocytes migrate from the circulation to the bacterial destruction during cellular changes. These alterations could be observed to investigate any medicinal substance to test for anti-inflammatory efficacy.[3]

Corchorus olitorius Linn (Malvaceae) is an annual herb can reach a height of 2.4 m. It has leaves with alternately slightly incised margins. Small, five-petalled yellow flowers of *C. olitorius* subsequently develop into a brown, multiseed pod.[4] In skin cosmetics, the leaf extracts can serve as moisturizers. The extracts are made up of uronic acid, which contains muco-polysaccharide, calcium, potassium, and other nutrients that work well as moisturizers. Cardenolides, beta-sitosterol, ceryl alcohol, and oligosaccharides are present in the seeds.

Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

SAMSKRUTI COLLEGE OF PHARMACY
Kondapur (V)
Ghatkesar (M)
R.R. Dist. Hyd.

This article can be downloaded from
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Principal
Samskruti College of Pharmacy
Kondapur (V), Ghatkesar
Medchal Dist. PIN-501301

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Divya et. al International Journal of Pharmacetical Sciences Letters

Luliconazole Niosomal Transdermal Drug Delivery System Development and Assessment

Divya [1],G.Rajani [2],Shilpadas [3],MD.Solaiman [4],
Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

ABSTRACT

Previous studies have shown that the use of niosomes as drug carriers yields better outcomes than other methods, especially when it comes to antifungal medications. Pharmaceuticals that are both hydrophilic and hydrophobic may be encapsulated in niosomes, which also prolongs their stability in circulation. The preparation and assessment of luliconazole niosomal gel for antifungal activity was the goal of this investigation. The present investigation included the preparation of luliconazole-containing niosomes by the thin-film hydration process, employing non-ionic surfactants (Span 60 and Tween 80) and cholesterol at varying concentrations. The produced formulations underwent evaluations for stability tests, in-vitro drug release investigations, drug content, drug entrapment efficiency, and optical microscopy. Better outcomes were shown when the ratio of cholesterol to span 60 was 2:1. It was thus refined to become the ultimate vesicle formulation. According to the results of the FTIR analysis, luliconazole and any of the excipients did not interact. The niosomes gel was assessed across all formulations for a number of criteria. The most favorable and encouraging outcomes are seen with the 1% Carbopol 934 gel. To improve transdermal effectiveness, the niosomal gel formulation may prove to be a helpful dose form.

Introduction

As an alternative to oral medicine administration and hypodermic injections, transdermal drug delivery has grown in favor. Transdermal medication administration specifically performs better than oral drug delivery in a number of areas, not the least of which is avoiding first-pass metabolism, which causes rapid drug metabolism and reduced bioavailability. Transdermal medicine delivery systems come with minimal costs and self-administration features. One drawback of this administration route is the limited number of drugs that may be modified for transdermal delivery. Technology advancements and developments in the area of drug delivery over the last several decades have made it possible to successfully create medications with suitable molecular weights or delivery systems for effective transdermal drug administration.[1] Therapeutically effective doses of medicine may be applied topically to a patient's skin using transdermal drug delivery devices (TDDS). For medicinal compounds to be transferred via human skin for systemic effects, consideration of the skin's whole morphological, biophysical, and physicochemical properties is required. Transdermal delivery increases patient compliance and prevents first-pass metabolism, giving it a competitive edge over injectables and oral techniques. Transdermal administration circumvents pulsed entry into the systemic circulation, which commonly has negative side effects, and enables continuous infusion of drugs with short biological half-lives. As a result, several cutting-edge drug delivery techniques, such as controlled release systems and TDDS, were developed. Among the numerous advantages of transdermal drug delivery are reduction of hepatic first-pass metabolism, enhancement of therapeutic efficacy, and maintenance of a stable drug plasma level.[2] The terms "topical" and "transdermal" are often used interchangeably, with ambiguous meanings. This arises from the fact that all medications given topically—that is, on the skin's surface—are topical by definition. On the other hand, medications administered topically that function locally via passive skin dispersion are sometimes referred to as "topical medication." On the other hand, transdermal medications are applied topically, but they work by increasing the amount of drug that can pass through the skin barrier, often to the point where the drug enters the bloodstream and affects areas other than the skin. This is achieved through the use of technology,

SAMSKRUTI COLLEGE OF PHARMACY
Kondapur (V)
Ghatkesar (M)
R.R. Dist. Hyd.

Principal
Samskruti College of Pharmacy
Kondapur (V), Ghatkesar (M),
Medchal Dist. PIN-501301

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G.Ratnakumari et. al International Journal of Pharmacetical Sciences Letters

Better Colorimetric Reserpine Determination in Tablets with 4-Caboxyl-2,6-dintrobenzene diazonium ion (CDNBD) Utilization

G.Ratnakumari [1],V.Raju [2],Divya [3],Mariya Sultana [4],
Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

Abstract

Goal: Creating a quick, easy, and enhanced colorimetric technique for reserpine tablet assay
Method: The procedure involves combining the aromatic rings of reserpine with the diazonium ion of 4-carboxyl-2,6-dinitrobenzene, which results in the creation of an azo adduct. The assay of reserpine in tablets was conducted by means of method application and optimization of reaction conditions and validation.
Result: Reserpine and CDNBD bonded easily, and when the experimental conditions were optimized, the reaction was finished in 10 minutes at room temperature. For the azo adduct that formed, a 1:1 drug to reagent stoichiometric ratio was found. In relation to the medication, the adduct showed a bathochromic shift, while in relation to the reagent, it showed a clear hyperchromic shift. 470 nm colorimeters were used for sample analysis. The tests demonstrated linearity and reproducibility within the 2.25 - 24 µg/mL concentration range. The analysis of reserpine in tablets was effectively conducted using the novel approach, with results that were comparable to those of the official (USP) spectrophotometric method ($p > 0.05$). When compared to the previously published colorimetric technique for reserpine, this approach offers a significant improvement.
In conclusion, the devised approach is quick and may be used for serpine in-process quality control.
KEYWORDS: diazo coupling, 4-Caboxyl-2,6-dintrobenzene diazonium ion (CDNBD), colorimetric, and serpine

INTRODUCTION

Reserpine is an alkaloid that is synthesized or extracted from the roots of several Rauwolfia (Apocyanaceae) species, namely R. serpentina and R. vomitoria. It's possible that the substance derived from natural sources contains similarly comparable alkaloids. 1. Ancient Hindu Ayurvedic texts describe the therapeutic use of the root of the climbing plant Rauwolfia serpentina (Benth.), which is native to India2. Reserpine has been used to treat schizophrenia and other chronic psychoses as well as hypertension. Additionally, it has been used to treat Raynaud's syndrome. Chemically speaking, reserpine is 3,4,5-trimethoxybenzoyl methyl reserpate3 or (3β, 16β, 17α, 18β, 20α)-11, 17-dimethoxy-18 [(3, 4, 5-trimethoxybenzoyl)-oxyl] yohimban-16-carboxylic acid methyl ester. The only recognized component of the BP 2002 4 is the active pharmaceutical ingredient, which is identified by a UV process after nitrosation. All Rauwolfia preparations according to USP 24/NF 195 are UV-treated after a thorough and prolonged solvent extraction process. In the USP 24/NF 19, assays for further multi-ingredient formulations containing serpine are conducted using HPLC techniques. It has been reported that reserpine and other indole alkaloids from Rauwolfia vomitoria and serpentina were determined using HPLC and HPTLC. The optimal HPLC separation was obtained using 10% CH3CN and 0.1% trifloroacetic acid in water.6. A two-step HPLC analysis, both qualitative and quantitative, of a reserpinechlorothiazide combination has also been reported7. There are also descriptions of other chromatographic techniques8. Numerous flourimetric methods for reserpine in dosage forms, bulk, or biological fluids have been reported. Hydrogen peroxide, selenious acid, p-toluenesulphonic acid, vanadium pentoxide, hexa-amine cobalt (III) tricarbanato cobaltate, and 2-iodoxybenzoate in aqueous acetic acid are some of the agents that have been used. In addition, a flow-injection assembly was implemented after fluorescence derivatization11. The measurement of reserpine and two more Rauwolfia alkaloids, yohimbine and rescinnamine, using chemiluminometric analysis based on a reaction with KMnO4/polyphosphoric acid, has been reported12.

SAMSKRUTI COLLEGE OF PHARMACY Kondapur (V) Ghatkesar (M) R.R. Dist. Hyd.

Principal
Samskruti College of Pharmacy
Kondapur (V), Ghatkesar (M)
Medchal Dist. PIN-501301

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T. Vijayalakshmi et. al International Journal of Pharmacetical Sciences Letters

Creation and Design of a Proniosomal Transdermal Captopril Drug Delivery System

T.Vijayalakshmi [1],T.Swathi [2],Shazia [3],Malyala Pravardhan [4],
Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

Abstract

The study's objective was to create a proniosomal carrier system that would effectively transport the entrapped medication over a prolonged period of time in order to treat hypertension.Method: Proniosomes were used to encapsulate captopril in different proniosomal gel formulations made of different ratios of sorbitan fatty acid esters, cholesterol, and lecithin that were prepared using the coacervation-phase separation method in order to explore the drug's potential as a transdermal drug delivery system. Size, vesicle count, drug entrapment, drug release patterns, and vesicular stability under various storage settings were all measured in vitro for the developed systems. For four weeks, proniosomal gel stability investigations were conducted.Results: 66.7 - 78.7% of the encapsulated material was produced using the proniosome loading technique.Transmission electron microscopy was used to characterize protoniosomes. In vitro research revealed a delayed release of captopril that was entrapped. Higher drug retention was seen under cold settings.In conclusion, our research clearly shows that proniosomes have a fair amount of stability and are a viable long-term delivery strategy for captopril.

KEYWORDS: Transdermal delivery, in vitro release, stability studies, pioniosomes, and captopril.

INTRODUCTION

Functional molecules might be delivered via a carrier to the site of action and released to carry out their function in order to seek the best possible therapeutic action1. Niosomes, which are tiny lamellar structures made of non-ionic surfactant, dicetyl phosphate, and cholesterol mixed together and then hydrated in aqueous medium, are non-ionic surfactant vesicles.

Proniosomes provide a flexible vesicle drug delivery idea that may be used to administer medication transdermally. This might occur if proniosomes under occlusive circumstances transform into niosomes when they are hydrated with water from the skin after topical application.3.Proniosomes reduce niosome physical stability issues such fusion, aggregation, and leakage while offering more dosage, storage, and transit convenience4.

Interest in transdermal medicinal systems has increased due to their many benefits, which include reduced side effects, a relatively simple way to stop medication input in difficult instances, a non-invasive parental route for drug administration, and the avoidance of first pass gut and hepatic processing. 5. A common therapy for hypertension and congestive heart failure is captopril, an oral active inhibitor of angiotensin-converting enzyme (ACE). The medication is seen to be the preferred option for antihypertensive treatment because of its efficiency and little toxicity. Captopril has a 75% bioavailability, although oral absorption is decreased by 30% to 50% when food is present. A prior study found that since the oxidative product of captopril, captopril disulfide, exhibits poor intestinal absorption, the oxidation rate of captopril in dermal homogenate is much lower than that of intestinal homogenate. 7. When used initially, captopril induces hypotension, which may be dangerous for people with congestive heart failure and diuretics. Patients with myocardial infractions may have certain complications from persistent hypotension 8. Consequently, using a transdermal medication delivery method may lessen captopril's negative effects. The chemical captopril has been transported into the skin layer using niosome carriers, which are widely recognized for their potential in topical medication administration.

SAMSKRUTI COLLEGE OF PHARMACY
Kondapur (V)
Ghatkesar (M)
R.R. Dist. Hyd.

Principal
Samskruti College of Pharmacy
Kondapur (V), Ghatkesar (M),
Medchal Dist. PIN-501301

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An experience with the colorimetric testing of amlodipine in physiological fluids: interference in drug assay by phytochemicals

B.Sudhakar [1], K.Radhika [2],R.Mounika [3],Bandari Teja [4,]

Abstract

This study aims to examine the possible interactions between amlodipine (AML) and methanol extract of Aframomum melegueta seeds (AMSE). Methods: Using the potassium ferricyanide/FeCl3 (FeCl3/K4(Fe(CN)6)) technique, amlodipine concentrations of 2.5, 5.0, 7.5, 10, 12.5 and 15 µg/mL were tested in vitro with or without AMSE. Absorbance measurements were taken at 393.1, 455.6, and 774.8 nm, and the solution was then subjected to wavelength scanning in the 380–950 nm range. Conclusions: The presence of Aframomum melegueta seeds (AMSE) in biological fluids and AML solutions considerably hindered the reaction of FeCl3/K4(Fe(CN))6. The maximum interference was seen at 774.8 nm, and a concentration of 50 µg/mL AMSE resulted in a 2.5 µg/mL rise in absorbance, which is 1.5 times higher than when it was not present. The sample's spectra showed two extra peaks at 393.1 and 455.6 nm, with unit increments of just 0.07 and 0.16 nm, respectively, when AMSE was present. At these two wavelengths, Beer-Lambert's law was met by the concentration-absorption relationship. It was decided not to follow Beer-Lambert's rule after the AML concentration reached 15 µg/mL at 774.8 nm. This research concludes that the components of the Aframomum melegueta seed methanol extract may interact with one another in AML testing techniques. In addition, measurements of concentration at either 393.1 or 455.6 nm have been shown to be reliable. When measuring drugs in populations where the use of herbal treatments is likely to occur concurrently, this should be taken into consideration. Amlodipine, Aframomum melegueta, Colorimetry, Interference

INTRODUCTION

Amlodipine (AML) Besylate is a dihydropyridine calcium channel blocker clinically used as an antihypertensive, anti-angina drug [1,2], as well as a peripheral arterial vasodilator [3,4]. Its chemical name is 3-ethyl-5-methyl (4RS)-2-(2-aminoethoxymethyl)-4-(2-chlorophenyl)-1,4-dihydro-6-methylpyridine-3,5-dicarboxylate benzenesulfonate (Figure 1) [5].

In an attempt to carry out a pharmacokinetic study of amlodipine (AML) in rodents using potassium ferricyanide/FeCl3 (FeCl3/K4(Fe(CN)6)) colorimetric method [4], absorbance values obtained showed wide variations such that measured AML concentrations did not conform to any reasonably expected pattern consistent with pharmacokinetic characterization [5]. Several studies have revealed potential interactions of herbal constituents with amlodipine. For example, the antihypertensive effect of amlodipine was augmented by *Lepidium sativum* and *Curcuma longa* extract [6]. In another study, green tea and cumin increased plasma concentration of amlodipine and prolonged antihypertensive effect [7]. A major key issue is not about the efficacy of herbal preparations, but the fact that the preparations are almost always marketed as food supplements in order to avoid rigorous and stringent regulatory requirements. This designation as food supplements implies that such substances are as safe for general consumption as ordinary food is. In addition, wide use of herbal remedies may not only be due to resource

Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,

SAMSKRUTI COLLEGE OF PHARMACY
Kondapur (V)
Ghatkesar (M)
R.R. Dist: Hyd.

Principal
Samskruti College of Pharmacy
Kondapur (V), Ghatkesar (M)

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Shazia et. al International Journal of Pharmacetical Sciences Letters

Antimicrobial Resistance in Staphylococcus aureus Isolates Occurring in a Community in Zaria, Nigeria, from Healthy Women

Shazia [1],Shilpadas [2],Divya [3],MD.Shakil Ansar [4,]
Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

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SAMSKRUTI COLLEGE OF PHARMACY
Kondapur (V)
Ghatkesar (M)
R.R. Dist, Hyd.

Principal
Samskruti College of Pharmacy
Kondapur (V), Ghatkesar (M),
Medchal Dist. PIN-501301

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Wistar albino rats' cognitive and behavioral parameters are changed by acute intermittent hypoxia therapy.

K.Umadev [1],R.Mounika [2],B.Sudhakar [3],Chukka Navya Sri [4].

ABSTRACT

Effective preventive and treatment techniques are necessary for cognitive illnesses, such as dementia and Alzheimer's disease, which present significant global health issues. With its short exposures to lower oxygen levels, intermittent hypoxia treatment (IHT) is a unique method that may have advantages for cognitive function. This research uses extensive behavioral studies, such as the Morris water maze (MWM) and open field test (OFT), to examine the effects of IHT on cognitive function in wistar albino rats. The findings show that IHT enhances cognitive flexibility, decreases behaviors associated with anxiety, and increases locomotor activity. The IH group had more mobility in the OFT, as shown by more grid crossings and distance traversed. This may be linked to improved cognitive function. In addition, compared to the control group, IH dramatically decreased the amount of fecal boli and thigmotaxis behavior, suggesting decreased anxiety levels. IHT enhanced platform identification in the probing test but did not substantially increase spatial memory acquisition in the MWM. Increased time spent in the target quadrant by the IH group suggests improved recognition and recall of memories. Furthermore, IH showed modest gains in cognitive flexibility in the reverse MWM, with quicker latency on trial 1. These results imply that IHT has potential as a non-invasive strategy for improving cognition, especially with regard to reduced anxiety, increased locomotor activity, and specific memory and cognitive flexibility issues.

Introduction

Cognition, the complex process of acquiring, processing, and utilizing knowledge, is at the core of human behavior, distinguishing us from other species and driving our progress.[1] However, cognitive disorders like dementia and Alzheimer's disease pose significant global health challenges, affecting millions.[2,3] leading to profound cognitive impairment and diminished quality of life.[4] Understanding the fundamental mechanisms of these disorders is crucial for effective prevention and treatment. Lifestyle factors such as exercise, social engagement, and mental stimulation have been identified as potential ways to reduce cognitive decline.[5] Intermittent hypoxia therapy (IHT), involving brief exposure to reduced oxygen levels, presents an innovative approach akin to the benefits of physical exercise.[6] Effective IHT protocols depend on factors like the severity and duration of hypoxia exposure, with modest and acute exposures showing potential benefits.[7] Severe hypoxia can lead to cellular damage and an increased risk of neurodegenerative disorders.[8] In contrast, IHT triggers adaptive mechanisms, promoting neuroplasticity and potentially enhancing brain function.[9, 10] To explore IHT's potential in promoting cognition, this study examines cognitive parameters in wistar albino rats using behavioral experiments such as the open field test (OFT) and Morris water maze (MWM).[11,12] These tests provide comprehensive insights into

Assistant professor 1,2,3,4,
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

SAMSKRUTI COLLEGE OF PHARMACY
Kondapur (V)
Ghatkesar (M)
R.R. Dist. Hyd.

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Principal
Samskruti College of Pharmacy
Kondapur (V), Ghatkesar (M)
Medchal Dist. PIN-501301

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Assessing the potential toxicity of Assessing the potential toxicity of Assessing the potential toxicity

K.Radhika [1],B.Sudhakar [2],J.Mahesh [3],Bammidi Naveen [4,]

Abstract

Using an animal model, this study aims to demonstrate that Sargassum plagiophyllum extract is safe for human consumption. Methods: An autoclave set at 121°C for 20 minutes was used to extract water from Sargassum plagiophyllum, which is known as SPE. For 21 days, four groups of adult male mice were gavaged with the SPE. A range of SPE doses—100, 500, 1000, and 2000 mg/kg—were administered to the treatment groups. Mice served as controls were given pure water. Individuals' dietary consumption, as well as their weight, were documented. Blood, biochemical, and histological indicators were used to evaluate the toxicity of SPE. Findings: Not even at 2000 mg/kg did 21 days of SPE ingestion affect body mass, feed intake, or water intake. Additionally, there was no change in hemodynamic parameters. The results of the biochemical examination of the blood and serum showed that all of the treatment groups, in comparison to the control group, had normal levels of creatinine, alanine transaminase (ALT), aspartate transaminase (AST), and alkaline phosphatase (ALP). Organs such as the liver, kidneys, colon, and others were found to be in good health across all therapy groups, according to histological investigations. In conclusion, our mouse model findings broaden the potential medicinal application of Sargassum plagiophyllum extract by providing fundamental scientific proof that it is safe to consume, even at large dosages. Sargassum plagiophyllum, brown algae, animal testing, histopathology, and safety

INTRODUCTION

Brown algae (Phaeophyceae) are the most important seaweeds in temperate coastal ecosystems around the globe. In the class Phaeophyceae, the genus *Sargassum* is the largest brown algae present in large quantities in the coastal regions of Andaman Sea and Thai Gulf. Brown algae live in harsh environments which stimulate the formation of secondary metabolites, and in turn, these substances exert specific biological activities [1]. They constitute a rich source of bioactive molecules such as alginate, laminarin, and fucoidan, and have been used for a long time as food and folkloric medication in Asia.

The pharmacological activities of brown algae have gradually aroused scientific interest. There are reports on the anticancer activity of *Sargassum oligocystum* extract against human cancer cell lines [2]. Moreover, *Sargassum polycystum* extract exerted anti-melanogenic effect by inhibiting cellular tyrosinase activity in melanoma cells [3]. A study has shown that *Sargassum wightii* extract possesses anti-nociceptive and anti-inflammatory activities [4]. A more recent study reported the antioxidant activities of a *Sargassum plagiophyllum* extract [5]. The consumption of this extract showed potential to prevent constipation in mice by enhancing colon function and modulating the gut microbiota [6]. With respect to human health, it is perhaps not only the bioactive molecules in seaweed that have

Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

SAMSKRUTI COLLEGE OF PHARMACY
Kondapur (V)
Ghatkesar (M)
R.R. Dist. Hyd.

Principal
Samskruti College of Pharmacy
Kondapur (V), Ghatkesar (M),
Medchal Dist. PIN-501301

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A RARE INSULMAME-MEDIATED PYROPTOSIS CURE THAT MAY BE USED TO ADDRESS ACUTE PANCREATITIS

Dr.Aneela [1], Dr.Y.Sirisha [2], Adithyamathur [3], Ashraful alom [4],
Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

ABSTRACT

This study aims to examine the role of membrane-associated ring-CH-type finger 9 (MARCH9) in the regulation of acute pancreatitis (AP). Methods: Ten healthy persons and fifteen AP patients hospitalized to Changzhou Second People's Hospital Nanjing, China, took part in the research. We tested the individuals' serum samples for MARCH9 expression. Inducing rat pancreatic acinar (PA) cells with ceruletide and then transfecting them with a MARCH9 overexpression vector allowed for the establishment of an AP cell model. We found the molecular structure and level of MARCH9, which are associated with pyroptosis and inflammatory cytokines. Caspases 1 activity and cell survival rate were measured. The results showed that both the serum of AP patients and ceruletide-induced PA cells have low levels of MARCH9. The survival rate of ceruletide-induced PA cells was boosted and the levels of inflammatory cytokines and components associated with pyroptosis were lowered when MARCH9 was overexpressed. In ceruletide-induced PA cells, caspase 1 activity was shown to be decreased when MARCH9 was overexpressed. Furthermore, when ceruletide was used to elevate PA cell levels of IL6, p-STAT3/STAT3, and p-JAK2/JAK2, the overexpression of MARCH9 exhibited a negative regulatory impact. Results: MARCH9 overexpression inhibits NLRP3-induced pyroptosis in PA cells via controlling the IL6/JAK/STAT3 pathway; this finding may have implications for the treatment of AP. Pyroptosis, acute pancreatitis, AR42J cells, Ceruletide.

INTRODUCTION

Acute pancreatitis (AP) is an acute abdominal disease and the mortality rate can reach 47 to 69 % [1]. Blood amylase and lipase are significantly increased in AP patients, which can also be accompanied by an increase in blood sugar [2]. Systemic inflammation brings a second strike to the patients by increasing the burden on organs and exacerbating the severity of AP [3]. Therefore, seeking effective treatment for AP is currently a hot topic in research. Pyroptosis is a form of cell death involving members of the caspase family [4,5]. The release of pro-inflammatory cytokines induced by activating NLRP3 inflammatome is one of the causes of pyroptosis. [6]. For instance, the activation of receptor-associated factor 6 induces pyroptosis through the caspase 1 3 signaling pathway, thereby contributing to the progression of AP [7]. Therefore, inhibiting the occurrence of pancreatic cell pyroptosis is one of the ways to alleviate AP. Membrane associated ring-CH-type finger (MARCH) includes 11 family members, from MARCH1 to MARCH11 and they play a role in immune regulation, cell polarity, and toll like receptor signal transduction [8]. MARCH9, a member of the MARCH protein family, may be related to cellular immune regulation [9]. In addition, it was recently shown that MARCH9 regulates the pancreatic cells pyroptosis induced by NLRP3 inflammasome in AP [10]. This indicates that MARCH9 participates in the regulation of AP

SAMSKRUTI COLLEGE OF PHARMACY Kondapur (V) Ghatkesar (M) R.R. Dist. Hyd.

Principal
Samskruti College of Pharmacy
Kondapur (V), Ghatkesar (M),
Medchal Dist. PIN-501301