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PRIYADARSHINI J. L. COLLEGE OF PHARMACY
(Formerly known as J. L. Chaturvedi College of Pharmacy)
Electronics Zone Building, MIDC, Hingna Road, Nagpur-440016 (M.S.) India
Tel. No.: +91-7104 – 299510
E-mail: principal@pjlcp.edu.in, ilccpngp@gmail.com ● Website: www. pjlcp.edu.in
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Review Article

Novel Corona Virus COVID-19: An Overview

Rohini Agrawal, Prashant Amale, Shilpa A Deshpande*, Priti Bhoyar, Kiran Gomkale and Sunchuwar

Priyadarshini J. L. Chaturvedi College of Pharmacy, Electronic Zone Building, MIDC, Nagpur, Maharashtra, India

***Corresponding Author:** Shilpa A Deshpande, Priyadarshini J. L. Chaturvedi College of Pharmacy, Electronic Zone Building, MIDC, Nagpur, Maharashtra, India.

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Abstract

Virus Disease of 2019 (COVID-19), was proclaimed as a pandemic emergency by World Health Organisation (WHO) in March 2020. The main causative factor behind the pneumonic viral infection is Severe Acute Respiratoty Syndrome Coronavirus - 2 (SARS-CoV-2) which holds the 75 - 80% nucleotide sequence similarity with SARS-CoV. Infected and asymptomatic individual are the primary source of human to human transmission due to it become a pandemic, the women with third trimester is also susceptible to this respiratory and pneumonic infection. The time period for the infection is 14 days and the average duration is of 20 days. The infection is clinically manifested mainly by fever, shortness of breath, Acute Respiratory Distress Syndrome (ARDS) etc. Various diagnostic approaches such as Nucleic Acid Amplification Test (NAAT) by using RT-PCR, serological testing etc had been used among which RT-PCR found to be successful in the detection of strain of SARS-CoV-2. Present review focus on the genomic structure of SARS-CoV-2, mechanism, transmission, entry into the host cell, diagnosis, and prevention of the Covid-19. This may be helpful for the development of therapeutic agents used for prophylaxis and treatment of SARS-CoV-2.

Keywords: Covid-19; Corona Virus; WHO; SARS-CoV-2; RT-PCR

Introduction

Corona virus disease (COVID-19); a pneumonic viral infection generated by Severe acute respiratory syndrome coronavirus -2 (SARS-CoV-2) and proclaimed on March 11, 2020 as pandemic by World Health Organisation (WHO) [1]. It is attributed by a respiratory syndrome with a different range of its seriousness from mild upper respiratory illness to severe interstitial pneumonia and acute respiratory distress syndrome (ARDS) [2,3].

Coronavirus

Coronavirus was first discovered 1960 belongs to the family of *Coronaviridae* and *Nidovirales* order with two subfamilies viz. *Orthocoronavirinae* and *Torovirinae* in which *Orthocoronavirinae* involves four genera α, γ and δ-coronavirus [4]. They include total 49 species under the major Riboviria of the suborder of *Cornidovirineae* [5]. The human coronavirus OC43 (HCoV-OC43), Human coronavirus (HCoV-HKU1), SARS-CoV, SARS-CoV-2 and Middle East Respiratory Syndrome Corona Virus (MERS-CoV) comes under β-coronavirus. Whereas genus and Human coronavirus NL63 (HCoV-NL63) and Human coronavirus 229E (HCoV-229E) comes under α-coronavirus genus. It belongs to the subgenus *Sarbecovirus* and mostly bears a resemblance with bat coronavirus (96.2%) [6]. But, intermediary host of transmission is still unknown.

REVIEW ARTICLE

INTERNATIONAL JOURNAL OF RESEARCH IN PHARMACEUTICAL SCIENCES

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Resveratrol: A Pleiotropic Phytoconstituent

Prashant N. Amale[1], Manish P. Deshmukh[2], Ashish B. Budhrani[3], Shilpa A. Deshpande*[1]

[1]Department of Pharmacology, Priyadarshini J. L College of Pharmacy, MIDC, Electronic Zone Building, Hingna Road, Nagpur, Pin-440016, Maharashtra, India
[2]Department of Pharmacology, Jawarharlal Nehru Medical College, Datta Meghe College of Pharmacy, Datta Meghe Institute of Medical Sciences (DU), Wardha, Pin-442001, Maharashtra, India
[3]Department of Pharmaceutics, Datta Meghe College of Pharmacy, Datta Meghe Institute of Medical Sciences (DU), Wardha, Pin-442001, Maharashtra, India

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Keywords:

Resveratrol, Pleiotropic, phytoconstituents, pain, inflammation

ABSTRACT

Resveratrol (RSV) is a plant polyphenol or phytolexin phytoconstituents obtained from the grapes, berries, peanut, and wine. RSV is obtained from natural source and regarded as safe, effective, and hepatoprotective drug with no other serious organ toxicities are reported yet. This property of RSV makes it advantageous over the allopathic medicine having symptomatic cure and plethora of adverse effects. It's a cheap and widely available phytoconstituent approved in the global market in the active form as trans-resveratrol. It has multiple pharmacological actions including, analgesic, anti-inflammatory, anti-anxiety, anti-parkinsonian, anti-alzheimers, antioxidant, antidepressant, anti-cancer, anti-diabetic, anti-atherosclerotic effects. These effects are mediated via modulation of diverse underlying endogenous molecules like reactive oxygen species, nitric oxide, malonaldehyde, neutrophil, sirtulin, cyclo-oxygenase, inducible nitric oxide syntheses, superoxide dismutase, catalase, glutathione s-transferase, alpha-secretase, metalloproteinases, C-reactive protein, dopamine, nor-adrenaline, serotonin, cytokines (interleukins), nuclear factor kappa, signal transducer activator of transcription, brain derived neural nactor, neuropeptide, hypothalamo-pitutary axis, astroglia, mitochondrial dysfunction, glutamate, adrenergic, cholinergic, opioidergic, and purinergic receptors. Researchers are trying to explore its additional health benefits and preparing new analogues for better survival in the field. Present review will help to enlighten the multi-target pleiotropic pharmacological nature of a RSV in relation to the variety of the molecular targets modulation through extensive web science literature survey.

*Corresponding Author

Name: Shilpa A. Deshpande
Phone: +91-9422443171
Email: Shilpa@hotmail.co.in

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INTRODUCTION

Resveratrol (RSV) is a polyphenol, abundantly found in grape (skin and seeds), berries, peanuts and wine. This compound has many properties, including activity against glycation, immune response, oxidative stress, inflammation, neurodegeneration, several types of cancer, and aging (Kataria and Khatkar, 2019). RSV is well tolerated phytoconstituent and believed to be a promising compound in preventing many diseases, like depression, diabetes, asthma and other complications (Chen

REVIEW ARTICLE

INTERNATIONAL JOURNAL OF RESEARCH IN PHARMACEUTICAL SCIENCES

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Evolutionary Role of Epigenetics in Ischemic Stroke: A Review

Rohini Agrawal[1], Prashant Amale[1], Shilpa Deshpande[1], Manish Deshmukh[2], Priti Bhoyar[1], Kiran Gomkale[1], Uma Sunchuwar[1], Ashish Budhrani[*3]

[1]Department of Pharmacology, Priyadarshini J. L College of Pharmacy, Electronic Zone Building, Nagpur-440016, Maharashtra, India
[2]Department of Pharmacology, Datta Meghe College of Pharmacy, Datta Meghe Institute of Medical Sciences (DU), Wardha-442001, Maharashtra, India
[3]Department of Pharmaceutics, Datta Meghe College of Pharmacy, Datta Meghe Institute of Medical Sciences (DU), Wardha-442001, Maharashtra, India

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Epigenetics,
Ischemic stroke,
Excitotoxicity,
Stem cell,
REST

ABSTRACT

Stroke is a Central Nervous System (CNS) disorder which occurs due to the obstruction in the brain blood flow. Stroke is mainly of two types, such as ischemic and hemorrhagic stroke. Ischemic stroke (80%) caused due to obstruction of blood flow through Middle Cerebral Artery (MCA) and characterized by a decreased supply of oxygen and glucose to CNS. In comparison, Hemorrhagic stroke (20%) mainly occurs due to the rupturing of blood vessels. Epidemiologically, it is the common reason of death after cancer and affecting millions of global population. There are many risk factors such as hypertension; hypercholesterolemia etc. which can exaggerate the condition of stroke. Various conventional therapies like Antiplatelets, Thrombolytic are available, but, there is a need to obtain a therapeutic approach that can provide prevention as well as a cure for the stroke. So the present review is primarily focused on epigenetic approach for ischemic stroke by Endogenous Transplantation of Neural Stem/Progenitor Cells (NSPCs). This, in turn, will decrease the level of REST protein at the genetic level and enhance the activity of Na+-Ca+ exchanger activity and lowers the excitotoxicity.

*Corresponding Author

Name: Ashish Budhrani
Phone: 8888944700
Email: ashu.budhrani123@gmail.com

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INTRODUCTION

Stroke is a debilitating neurological condition and defined as a sudden loss of functions of neurons including either loss of supply of glucose and oxygen, i.e. Cerebral Blood Occlusion (Ischemic Stroke) Figure 1 or inter cerebral bleeding (Haemorrhagic Stroke) (Moretti *et al.*, 2015). It shows symptom like limb weakness, bilateral or unilateral immobility, and inability to speak and become a reason of death and disability worldwide. It generally involves 1 in every 18 deaths and requires long-term care due to their functional and cognitive disabilities. There is a marked decrease in the survival rates of the victims suffering from ischemic stroke (68%) as compared to Haemorrhagic stroke (28%) (Krishnamurthi *et al.*, 2013). This is due to the formation of thrombus in the cerebral arteries, which leads to the obstruction of blood flow through the cerebral blood vessels, which cause irreversible cell injury. The present article is aimed to introduce the evolutionary epigenetic perspective for the prevention and treatment of ischemic stroke by endogenous

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ORIGINAL ARTICLE

Exploring the active constituents of *Oroxylum indicum* in intervention of novel coronavirus (COVID-19) based on molecular docking method

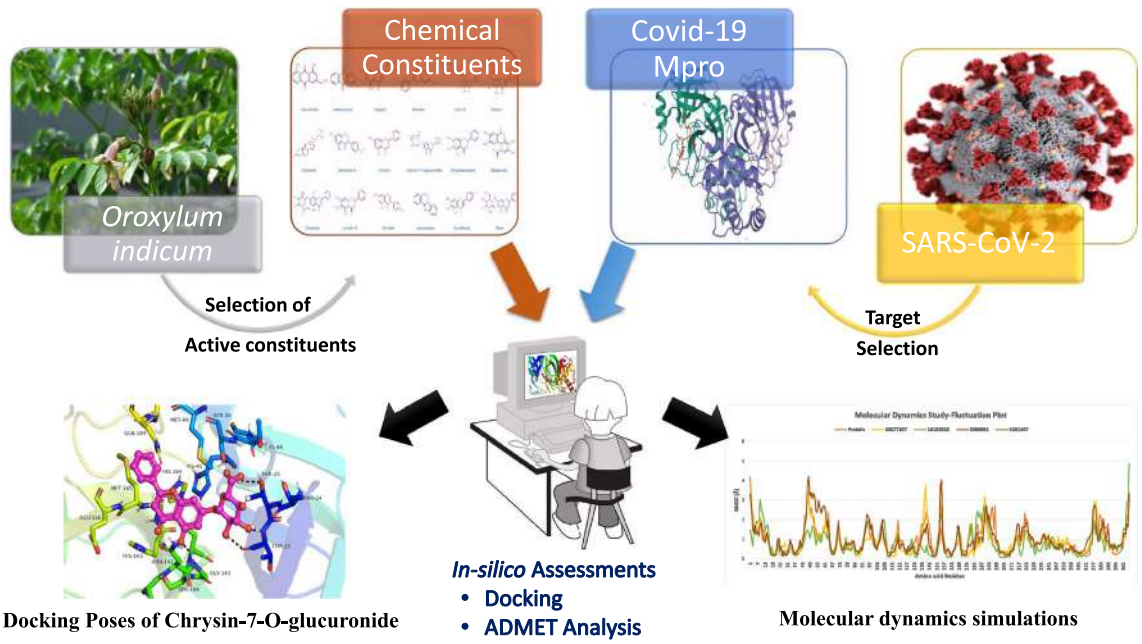
Sapan Shah[1] · Dinesh Chaple[1] · Sumit Arora[2] · Subhash Yende[3] · Keshav Moharir[4] · Govind Lohiya[4]

Received: 28 August 2020 / Revised: 24 November 2020 / Accepted: 15 December 2020 / Published online: 6 February 2021

Abstract

The severe acute respiratory syndrome COVID-19 declared a global pandemic by WHO has become the present wellbeing worry to the whole world. There is an emergent need to search for possible medications. We report in this study a molecular docking study of eighteen *Oroxylum indicum* molecules with the main protease (M^{pro}) responsible for the replication of SARS-CoV-2 virus. The outcome of their molecular simulation and ADMET properties reveal four potential inhibitors of the enzyme (Baicalein-7-*O*-diglucoside, Chrysin-7-*O*-glucuronide, Oroxindin and Scutellarein) with preference of ligand Chrysin-7-*O*-glucuronide that has the second highest binding energy (− 8.6 kcal/mol) and fully obeys the Lipinski's rule of five.

Graphical abstract



Keywords COVID-19 · *Oroxylum indicum* · Molecular docking · Molecular dynamics · ADMET study

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s13721-020-00279-y.

✉ Sapan Shah
shah.sapan@rediffmail.com

Extended author information available on the last page of the article

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Research Articles

Prospecting for *Cressa cretica* to treat COVID-19 via *in silico* molecular docking models of the SARS-CoV-2

Sapan Shah, Dinesh Chaple, Sumit Arora, Subhash Yende, Chetan Mehta & Usha Nayak

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Sapan Shaha*, Dinesh Chaplea, Sumit Arorab, Subhash Yendec, Chetan Mehtad & Usha Nayakd

a Department of Pharmaceutical Chemistry, Priyadarshini J. L. College of Pharmacy, Nagpur, Maharashtra, India

b Pharmacognosy and Phytochemistry Division, Gurunanak College of Pharmacy, Nagpur, Maharashtra, India

c Pharmacology Dvision, Gurunanak College of Pharmacy, Nagpur, Mahrashtra, India;

d Department of Pharmaceutics, Manipal College of Pharmaceutical Sciences, Manipal Academy of Higher Education, Manipal, Karnataka, India

Research Article | Published: 06 January 2021

Phytophospholipid Complex of Caffeic Acid: Development, *In vitro* Characterization, and *In Vivo* Investigation of Antihyperlipidemic and Hepatoprotective Action in Rats

Shubhada Mangrulkar, Pranav Shah, Sonali Navnage, Priyanka Mazumdar & Dinesh Chaple

AAPS PharmSciTech **22**, Article number: 28 (2021)

Abstract

Caffeic acid (CA), a hydroxycinnamic acid possessing a variety of pharmacological activities, has caused a growing interest for the treatment of hyperlipidemia and associated conditions. This work endeavored to develop a novel formulation of CA-Phospholipon® 90H complex (CA-PC) using a solvent evaporation method. Scanning electron microscopy (SEM), differential scanning calorimetry (DSC), Fourier transform infrared spectrophotometry (FTIR), and powder X-ray powder diffraction (PXRD) was carried to confirm the formation of CA-PC. The CA-PC was functionally evaluated in terms of solubility, *in vitro* and *ex vivo* drug release, and *in vivo* bioavailability and efficacy studies. SEM, DSC, FTIR, and XRD studies indicated the physical interaction of CA with Phospholipon® 90H to form a complex. Dynamic light scattering (DLS) studies described particle size of 168 ±

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ORIGINAL RESEARCH

Comparison of Efficacy of Topical Curcumin Gel with Triamcinolone-hyaluronidase Gel Individually and in Combination in the Treatment of Oral Submucous Fibrosis

Ashish B Lanjekar, Rahul R Bhowate, Suparna Bakhle, Abhay Narayane, Vipul Pawar, Ranjeet Gandagule

Keywords : Hyaluronidase mucoadhesive semisolid gel, Oral submucous fibrosis, Topical curcumin mucoadhesive semisolid gel, Triamcinolone acetonide mucoadhesive semisolid gel

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ARTICLE REFERENCES

Abstract

Aim: To study the efficacy of topical curcumin mucoadhesive semisolid gel, triamcinolone acetonide/hyaluronidase mucoadhesive semisolid gel, and a combination of both in the treatment of oral submucous fibrosis (OSMF). **Materials and methods:** One hundred and twenty patients diagnosed with OSMF were randomly divided into groups I, II, and III. Each patients in groups I, II, and III was given professionally prepared mucoadhesive semisolid gel of curcumin, a combination of triamcinolone acetonide and hyaluronidase mucoadhesive semisolid gel, and a combination of all three, respectively. Patients were instructed to apply the gel thrice daily for 6 weeks on buccal mucosa bilaterally using the tip of index finger. Three parameters were evaluated at the end of each week, namely, mouth opening, burning on visual analog scale (VAS), and the color of oral mucosa on the binary scale. The results were subjected to statistical analysis. **Results:** It was observed that the group administered the three drug combinations achieved the greatest mouth opening (mean increase 4.05 mm) as compared to the other two groups. It was observed that triamcinolone and hyaluronidase group reported reduction in burning sensation on VAS (mean difference 6) as compared to the other two groups. It was observed that group III (1% curcumin, 1% hyaluronidase and 0.1% triamcinolone acetonide combined) drug therapy showed better change in mucosa color as compared to groups I (1% curcumin) and II. **Conclusion:** Thus, we can conclude that curcumin has a therapeutic effect on patients diagnosed with OSMF. Maximum utilization and enhanced drug delivery were achieved with the help of a combination other two active drugs, namely, triamcinolone and hyaluronidase. **Clinical significance:** Curcumin role in the treatment of oral cancers and the precancer lesion is very promising.

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Original Article

Screening of super disintegrants by formulating and evaluating fast dissolving tablets of ondansetron hydrochloride

Dhanashree R. Wasu, Kanchan P. Upadhye

Department of Pharmaceutics, Priyadarshini J. L. College of Pharmacy, Hingna Road, Nagpur-440016, India

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ABSTRACT

For a fast dissolving tablet to show fast disintegration, super disintegrants play a vital role. The objective of the present study is to screen three super disintegrants namely Cross carmallose sodium, Sodium starch glycolate and Cross povidone by formulating fast dissolving tablets and evaluating them. First, the tablet blends were subjected to pre compression parameters (bulk density, tapped density, angle of repose, Hausner's ratio and Car's index). Then the tablet blends were formulated in fast dissolving tablets of 200 mg each of Ondansetron Hydrochloride by direct compression method. The tablets of various batches had varied concentrations of the three super disintegrants individually. The tablets were then evaluated for various post compression parameters (weight variation, thickness, hardness, friability, wetting time, water absorption ratio, disintegration time, drug content and *in-vitro* drug release). Out of all the batches the formulation T8 showed best results which implied that Cross Povidone can be considered as a good super disintegrant and that batch was optimised.

Keywords: Fast dissolving tablets, super disintegrants, Ondansetron Hydrochloride

Address for Correspondence: Dhanashree R. Wasu, Department of Pharmaceutics, Priyadarshini J. L. College of Pharmacy, Hingna Road, Nagpur-440016, India; Email: dhanashreewasu@gmail.com

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Review Article

Hemorrhoids: A Review on Herbal Treatments and Models for Pharmacological Evaluation

Priti S. Bhoyar*, Shilpa A. Deshpande, Prashant N. Amle, Kiran M. Gomkale, Rohini N. Agrawal, Uma P. Sunchuwar
Pharmacology Department, Priyadarshini J. L. College of Pharmacy, Electronic Zone Building, MIDC, Hingna Road, Nagpur, India.
***Corresponding author's E-mail:** pritibhoyar7@gmail.com

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ABSTRACT

Hemorrhoids are the most common anorectal disease which is characterized by alteration in vasculature of the anal canal including blood vessels, supporting tissues, muscles and elastic fibers. The aim of this review is to determine the importance of herbal drug in the treatment of hemorrhoids and pharmacological evaluation by using some models and in vitro studies. The role of *Acacia ferruginea, Allium iranicum, Balanites aegyptiaca, Euphorbia prostrata, Malva sylvestris, Myrtus communis, Phlomis grandiflora, Polygonum cognatum, Portulaca oleracea, Wendlandia heynei* in hemorrhoid treatment are discussed. According to this review it is found that above mentioned herbal plants decreased the level of inflammatory mediators and contributed to healing of hemorrhoidal edema.

Keywords: Hemorrhoid, Inflammatory mediators, Flavonoid, croton oil, Jatropha oil.

INTRODUCTION

Hemorrhoids are the most common anorectal disease[1] characterized by alteration in vasculature of the anal canal including blood vessels supporting tissues, muscles and elastic fibres.[2] There is a network of small veins within the inner lining of the anus and lower rectum. These veins occasionally become wider and engorged with more blood than usual. These engorged veins and the overlying tissue may then develop into one or more small areas of swelling called hemorrhoids.[3]

The symptoms of hemorrhoids are discomfort, itching, pain, inflammation, bleeding.[4] Various factors are responsible for hemorrhoids like constipation, life style, pregnancy, low fiber diet, obesity and other environmental factors.[5] There are three types of Hemorrhoids: Internal Hemorrhoids, External Hemorrhoids, Mixed Hemorrhoids.

Internal Hemorrhoids begin above the dentate line which are covered by mucosa, typically bleed or prolapsed but do not cause pain. It is divided into four categories depending on the grade of prolapsed.

I. Grade 1: Protrudes in the anal canal but does not prolapse
II. Grade 2: Prolapses but reduces spontaneously.
III. Grade 3: Prolapses and requires manual reduction.
IV. Grade 4: Irreducible prolapsed.

External hemorrhoids originate below the dentate line which cause pain and itching.

Mixed hemorrhoids indicate lesions that arise at the dentate line or the term can be used to describe the presences of both internal and external hemorrhoids.[6]

The exact pathophysiology of hemorrhoids is poorly understood. There are four theories of the pathophysiology of hemorrhoids. First, the vericose vein theory[7] which suggested that hemorrhoids are caused by vericose veins in the anal canal, has been shown to be faulty, because hemorrhoids and anorectal varices are proven to be different.[8] Second, the theory of vascular hyperplasia that hemorrhoids resemble penile erectile tissue and third, internal anal sphincter hypertonia, but both are not completely accepted.[9] The pathological changes occur like abnormal venous dilatation, vascular thrombosis, degenerative process in the collagen fibers and fibroelastic tissues, distoration and rupture of the anal subepithelial muscle along with this, changes a severe inflammatory reaction, mucosal ulceration, ischemia and thrombosis.[10]

Plant Sources Used in Treatment of Hemorrhoids

1. ***Acacia ferruginea* DC.**

It is deciduous tree belonging to family *Mimosoideae*.[11] The bark of the plant is bitter and used as astringent, cure itching, leukoderma, ulcers, stomatitis and blood related diseases. The *A. ferruginea* is a rich source of tannins (catechin, epigallocatechin), terpenoids, polyphenolics (gallic acid) and saponins. Also, the flavonoids, phenols, alkaloids, terpenoids, anthraquinones are chemical constituents of *A. ferruginea*. Glycosides and saponins are also present in trace amounts.[12]

The flavonoids in *A. ferruginea* reduce the concentration of PGE_{2e}, $PGE_{2\alpha}$ and others inflammatory mediator. It also increases the vascular tone and reduces the vascular fragility and resistance. The antioxidant and ant hemorrhoidal activity are due to presence of flavonoids in the bark of *A. ferruginea*.[2]

2. ***Aesculus hippocastunum***

Aesculus hippocastunum belonging to family *Sapindaceae* is a large deciduous tree known as horse-chestnut or

Research Article

Formulation and Evaluation of Vitamin E Enriched Cold Cream with Almond oil as an Internal Phase

Varsha Barethiya*, Abhijeet Kukde, Ashish Badwaik, Dr. Alpana Asnani, Dr. Gouri Dixit
Department of Pharmaceutics, Priyadarshini J.L.College of Pharmacy, Hingna Road, Nagpur-440016, Maharashtra, India.
***Corresponding author's E-mail:** varshabarethiya@gmail.com

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ABSTRACT

The aim of the present study is to formulate and evaluate cold cream enriched with vitamin E and almond oil providing moisturizing effect. The cold cream was prepared by incorporating beeswax, borax, sweet almond oil, vitamin E and all other excipients. Fusion method is used for the formulation of the cold cream. Five different formulations are prepared and evaluated for the compliance with the pharmacopoeial parameters. All the prepared formulations are evaluated for the various parameters like pH, color, homogeneity test, viscosity, rheological studies, stability studies, etc. Among all the formulations, F4 shows the best result and all the parameters comply with the IP standards. Stability studies proved that there are no significant changes in the formulated cold cream. Thus, it is concluded that the vitamin E enriched cold cream is well formulated and evaluated with almond oil as an internal phase.

Keywords: cold cream, sweet almond oil, rheological studies, stability studies, homogeneity.

INTRODUCTION

In the pharmaceutical markets, several dosage forms are designed and introduced by considering the patient needs to obtain more patient compliance and providing faster relief. All the dosage forms are having best properties and also some drawbacks are associated with it. Over the last years the treatment of illness has been accomplished by administering drugs to human body via various routes namely oral, sublingual, rectal, parental, topical, inhalation, etc. Among all the dosage form, for the topical application, creams are considered as superior over other dosage forms. Topical delivery can be defined as the application of a drug containing formulation to the skin to directly treat cutaneous disorder or the cutaneous manifestations of a general disease (e.g. psoriasis) with the intent of containing the pharmacological or the effect of drug to the surface of the skin or within the skin semi-solid formulations in all their diversity dominate the system for topical delivery, but foams, sprays, medicated powders, solutions and even medicated adhesive systems are in use.[1]

Cream is a topical preparation used for application to the skin where it gets absorbed through the various layer of the skin and it can also apply on the body parts such as face, hands, legs, skin etc. Creams are defined as, the semisolid dosage forms containing one or more medicinal substances dissolved or dispersed in suitable bases to form a homogenous mass. This term has traditionally been applied to semisolids that possess a relatively fluid consistency formulated as either water-in-oil (e.g. cold cream) or oil-in-water (e.g. vanishing cream) emulsions. Creams are considered as pharmaceutical products and cosmetic products as per their application. Medicated creams are the creams containing the medicinal substances and used to treat the skin related disorders. Un medicated creams are highly used in a variety of skin conditions (dermatoses) but they are not containing any medicinal substances. The use of the fingertip unit concept found to be helpful in guiding how much amount of topical cream is required to cover different areas.

The term has been restricted to products consisting of oil-in-water emulsions or aqueous microcrystalline dispersions of long-chain fatty acids or alcohols that are water washable and more cosmetically and aesthetically acceptable. Creams are used for the multiple purposes like to enhance beauty, to get therapeutic effect, to relieve sun burn, and moisturized skin, as a makeup base, etc. Medicated creams are used for treating various skin related conditions such as psoriasis, dermatitis, burns, vaginal infections (e.g. Triple Sulfa Vaginal Cream), dry skin, etc. Galen, a Greek doctor, discovered the cold cream and in the second century, he prepared the formulation of cold cream which was popularly known as 'Galen's cream'. He prepared the formulation by using an emulsion water and beeswax along with rose petals as the vital moisturizer ingredients of the cold cream. Cold creams not only moisturize the skin but are also used for removing makeup and temporary tattoo marks. The cream is rubbed on tattoo marks and then erased with a cotton ball. Cold cream uses are also associated with preparation of facial paints for kids.

Cold cream is useful for keeping the skin moisturized and emollient all the time, especially all through the winters by protecting the skin from becoming dry and avoids aggravation of skin problems during the cold season. It stretches and then faint lines of crack develop over lips and cheeks. If proper care is not taken, these cracks may further become red. A plethora of cold creams are seen

Synthesis, physicochemical characterization and analgesic evaluation of some new thieno [*2,3-D*] Pyrimidin 4(3*H*) one derivatives

Dinesh P Kawade[1*], Dinesh R Chaple[2], Pramod B Khedekar[3]

[1]Associate Professor, [2]Professor and Principal, [3]Professor, [1,2]Dept. of Pharmaceutical Chemistry, [3]Dept. of Pharmaceutical Sciences, [1,2]Priyadarshini J. L. College of Pharmacy, Nagpur, Maharashtra, [3]Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur, Maharashtra, India

***Corresponding Author: Dinesh P Kawade**
Email: drdinesh03@gmail.com

Abstract
A $POCl_3$ catalyzed, efficient, one-step and solvent-free synthesis of novel thieno [2,3-d] pyrimidin-4(3*H*)-one derivatives from 2-amino-4,5-substitutedthiophene-3-carbonitrile has been developed using various aliphatic acid under both conventional heating and microwave irradiation techniques. The formation of compounds was confirmed via elemental analysis and spectroscopic techniques like FTIR, ^{1}HNMR and mass spectroscopy. All synthesized compounds have been screened for their analgesic activity by using Eddy´s hot plate method. The synthesized compounds 2d, 2k and 2h showed good analgesic activity and compounds 2a, 2b, 2g and 2i showed moderate whereas remaining compounds possessed less analgesic activity compared with standard, Tramadol.

Keywords: $POCl_3$, Thieno[2,3-d]pyrimidin-4 (3*H*)-one, Analgesic activity, Eddy´s hot plate.

Introduction
Medication revelation is ceaseless and iterative process, which begin with the recognizable proof of lead atom of wanted natural activity (lead age and closures with the streamlining of this lead (lead advancement) for choice of new hopeful particle in sedate improvement.[1] The attention to synthetic, physical physiological, biochemical properties, receptor locales, SAR and stereochemistry and so on is extremely huge in sedate plan for the fruitful advancement of medication particle.[2] Since, sedate plan is a coordinated for building up the train which forecasts a time of adjusted medication, a medication lacking symptom. It looks to clarify impacts of natural structure or its physicochemical properties included.[3] It examines the procedures by which the medication s delivered their belongings; how they respond with the cellular material of inspire a specific pharmacological impact or reaction. How they changed or detoxified, used or disposal by living being.[4] These ideas are the building stones whereupon the structure of medication configuration in assembled. The various new advancements have been created and connected in tranquilize innovative work (R&D) to abbreviate the examination cycle and to decrease the costs[5]. Among them, computational methodologies have upset the pipeline of disclosure and advancement over the most recent 40 year, computational advances for medicate R&D have advanced rapidly, particularly in late decades with the extraordinary improvement of science, biomedicine, and PC ability.[6] The computational instruments have been connected in relatively every phase of medication R&D, which have incredibly changed the system of medication disclosure.[7] Aggravation is a neighborhood response of the vascular and supporting components of a tissue to damage bringing about the arrangement of protein-rich exudates; it is defensive reaction of the non particular insusceptible framework that serve to limit, kill, or to crush a harmful operator in planning for the way toward recuperating. The indication of aggravation are rubor (redness), calor (warm), dolor (pain), tumor (swelling), and functio lasea (loss of function).[8] Agony is an attributes neurophysical sensation emerging from a harmful boost.[9] It is isolated into integumental agony (i.e. shallow, identified with skin, muscle and joints) and instinctive torment (i.e Deep situated, related to heart, stomach, kidney and rankle bladder). Nonsteroidal calming drug and broadly utilized for the treatment of different incendiary infections and also to remember the hurts and agony.[10] They apply their restorative impact through down control of prostaglandin blend by restraining the rate restricting cyclooxygenase (COX) catalyst engaged with the provocative course.[11] Despite the fact that this medication are for the most part all around endured in understanding with joint condition, a high frequency of gastrointestinal symptom, for example, mucosal injury, discharge, and ulceration has been a significant issue in their medicine. These present helpful insufficiencies force the need to create more secure medication.[12]

An analgesics or painkillers are 'agents that relieve pain by elevating the pain threshold without disturbing consciousness or altering sensory-modalities'. Besides 'pain' may also be defined in psychological perspective as –'a particular type of sensory experience distinguished by nerve tissue from sensations, such as: touch, heat, pressure and cold.[13]

Thiophene containing compounds are well known to exhibit various biological effects. Heterocycles containing the thienopyrimidine moiety are of curiosity because of their intresting pharmacological and biological activities.[20-22] They bear structural analogy and isoelectronic relation to purine and several substitutedthieno[2,3-*d*] pyrimidine derivatives shown to exhibit prominent and versatile biological activities.[23-24] Over the last two decades, many thienopyrimidines have been found to exhibit a variety of synthesized as potencial anticancer,[25] analgesic,[26] antimicrobial[27,28] and antiviral agents.[29]

Review Article

Dissolution - A Quality Parameter for Testing of Pharmaceutical Dosage Form

Kusum Rajbhar[1]*, Yogita Jain[1], Varsha Barethiya[1], Shanu Sahu[1], Dr. Mrs. Gouri R. Dixit[2]
[1] Research scholar- Department of Pharmaceutics, Priyadarshini J.L. College of Pharmacy, Nagpur, India.
[2] Assistant Professor- Department of Pharmaceutics, Priyadarshini J.L. College of Pharmacy, Electronic zone building, Nagpur, Maharashtra, India.
***Corresponding author's E-mail:** kusumrajbhar02@gmail.com

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ABSTRACT

In the pharmaceutical industry, dissolution study is one of the vital tests for the evaluation of the pharmaceutical dosage form. Dissolution test is the most important tool for the testing of drug release profile of solid dosage form in the pharmaceutical preparation. Dissolution studies provide the knowledge about the efficacy of the dosage form. Dissolution tests are major for performing a various kind of investigations like drug degradation profiles, stability and shelf life studies, chemical stability and so on. Dissolution test can be easily performed in both the small and large scale with the proper techniques and it is also used for the comparison between the graph profile of the similar and different dosage form. Hence, it can be considered as the most qualitative and convenient test for the evaluation of the pharmaceutical solid dosage form.

Keywords: Dissolution, similarity factor, biopharmaceutical class, validation.

INTRODUCTION

Dissolution testing is a basic tool which is broadly used in the development of another pharmaceutical product. The test, in its most direct structure, consists of placing the formulation in a dissolution apparatus containing reasonable dissolution medium, allowing it to dissolve over a specified period of time and then assaying the resultant solution using appropriate analytical method to determine the measure of medication. Dissolution tests are significant for a variety of investigations like medication degradation profiles, stability and shelf life studies, physical and mechanical testing of dosage forms, upcoming QC testing on raw materials etc.

In-vitro dissolution testing serves as a significant tool for characterizing the biopharmaceutical quality of a product for additional turn of events and for evaluation of active ingredients/drug substances. In-vitro dissolution data are supportive in the evaluation and interpretation of potential risks, mainly in the case of controlled/modified-release dosage forms - for example as regards dose dumping, food impacts on bioavailability or interaction with other medications, which impact gastrointestinal environmental conditions. Biopharmaceutical aspects are as significant for stability concerns as they are for batch release after production, in-vitro dissolution being of high relevance in quality control and quality assurance. Last but not least, in-vitro dissolution information will be vital when assessing changes in production site, manufacturing procedure or formulation and assist in decisions concerning the requirement for bioavailability studies.

None of these purposes can be satisfied by an in-vitro test system without sufficient reliability. Reliability here would be characterized as the system being experimentally sound, yielding precise, accurate, repeatable outcomes and with adequate information on the in-vivo significance of the dissolution data obtained. Prerequisites for dissolution testing have been assessed in the literature. Since in-vitro dissolution is a physical test, characterized by convention and is of a destructive nature, proving reliability requires exceptional consideration. It therefore is within the scope of these Guidelines to characterize appropriate testing equipment and experimental design as well as to suggest the background for adequate physical and analytical validation, along with verification procedures according to the state of biopharmaceutical science. The Guidelines are primarily devoted to solid oral products. However, the general ideas may be adapted to in-vitro dissolution analysis of drug materials/powders, semisolid oral products, suppositories and, with distinctive limitations, to other non-oral products. [1-3]

History

The study of the dissolution procedure has been established since the end of the 19th century by physical chemists. Therefore, most of the important research in the field was not related to medications at all, and the basic laws for the depiction of the dissolution procedure were already available when interest in drug dissolution started to increase. In spite of the advances in vitro dissolution in chemical engineering sciences, in the pharmaceutical sciences the idea was not utilized broadly until the early 1950s.Until then the in vivo availability of the drug was thought to be determined exclusively by the disintegration of the tablet. For orally administered non-solution dosage forms, in vitro performance test procedures such as dissolution and disintegration are

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FORMULATION AND EVALUATION OF HERBAL TEA

Meera A. Ingale*, Dr. Gouri R. Dixit, Dr. Dinesh R. Chaple and Rohit T. Durge

Priyadarshini J. L. College of Pharmacy, Electronic Zone Building, MIDC, Hingna Road, Nagpur-440016, Maharashtra, India.

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***Corresponding Author**
Meera A. Ingale
Priyadarshini J. L. College of Pharmacy, Electronic Zone Building, MIDC, Hingna Road, Nagpur-440016, Maharashtra, India.

ABSTRACT

Herbal tea is essentially an herbal mixture made from leaves, seeds and/ or roots of various plants. As per popular misconception, they are not derived from the usual tea plants, but rather from what are called as 'tisanes'. There are several kinds of tisanes (herbal teas) that have been used for their medicinal properties. Some of them being consumed for its energizing properties to help induce relaxation, to curb stomach or digestive problems and also strengthen the immune system. Some of the popular herbal teas are Green tea, Star anise tea, Ginger tea, Tulsi tea, Cinnamon tea, Turmeric tea, Lemon grass tea, Cardamom tea, Stevia tea etc. Some of these herbal teas possess extremely strong medicinal benefits such as, Green tea is a 'non-fermented' tea, and contains more catechins, than black tea or oolong tea. Catechins are in vitro and in vivo strong antioxidants. In addition, its content of certain minerals and vitamins increases the antioxidant potential of this type of tea. Recent human studies suggest that green tea may contribute to a reduction in the risk of cardiovascular disease and some forms of cancer, as well as to the promotion of oral health and other physiological functions such as anti-hypertensive effect, body weight control, antibacterial and antiviruses activity.

KEYWORDS: Tisanes, Herbal tea, Herbal remedies, Herbal medicine.

INTRODUCTION

Herbal Tea, according to many, look like tea and is brewed as the same way as tea, but in reality, it is not considered a tea at all. This is due to the fact that they do not originate from the *Camellia sinensis* bush, the plant from which all teas are made.[1] Herbal teas are actually mixtures of several ingredients, and are more accurately known as 'tisanes.' Tisanes are made

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A COMPREHENSIVE REVIEW ON EMULGEL: A NEW APPROACH FOR ENHANCED TOPICAL DRUG DELIVERY

Rani J. Rode*, Gouri R. Dixit, Kanchan P. Upadhye, Suparna S. Bakhle and Rohit T. Durge

Department of Pharmaceutics, Priyadarshini J. L. College of Pharmacy, Nagpur -440016 Dist. Nagpur (M. S.) India.

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***Corresponding Author**
Rani J. Rode
Department of Pharmaceutics, Priyadarshini J. L. College of Pharmacy, Nagpur -440016 Dist. Nagpur (M. S.) India.

ABSTRACT

Emulgel is a new approach and recent technology of NDDS for topical drug transport having characteristics of dual controlled release i.e emulsion and gel Emulsion used for treating for muscle pain, headache, acne, psoriasis, rheumatoid arthritis. When emulsion and gel used in combination its known as Emulgel. Emulgel is transparent gel which is used in pharmaceutical and cosmetic product. Emulgel overcome the problem which is come in gel and emulsion. Gel is a new class of formulation, gel release drug faster in comparison of ointment, cream, lotion etc. Limitation of gel in the delivery of hydrophobic drug through the skin. Overcome the limitation on emulsion based approach is being used so that even a hydrophobic therapeutic moiety can exhibit the unique properties of gels. Emulgel is prepared by different polymers which act as an emulsifying agent and thickening agent because the gelling capacity of these polymers give rise to stable emulsions by decreasing interfacial and surface tension while at the same time increasing the viscosity of the aqueous phase. Emulgel are having major advantages on novel vesicular systems as well as on conventional systems considering various aspects. The emulgel provide several favourable properties for its dermatological use such as greaseless, thixotropic, easily spreadable, emollient, easily removable, non-staining, water soluble, longer shelf life, transparent, bio-friendly and pleasing appearance.

KEYWORDS: Emulgel, Emulsion based gel, Hydrophobic drugs, Topical drug delivery system, novel drug delivery.

INTRODUCTION

Topical drug administration is simplest and easiest route of localized drug delivery anywhere in the body by routes as ophthalmic, rectal, vaginal and skin. These are applied as wide spectrum of preparations in case of both cosmetic and dermatological, to the healthy or diseased skin. Topical drug delivery can be defined as the application of a drug containing formulation to the skin to treat cutaneous disorder directly. The topical drug delivery system is generally used where other routes (like oral, sublingual, rectal, parental) of drug administration fails or in local skin infection like a fungal infection. The main advantage of the topical delivery system is to bypass first pass metabolism. Avoidance of the risks and inconveniences of intravenous therapy and of the varied conditions of absorption, like pH changes, the presence of enzymes, gastric emptying time are another advantage of The topical drug delivery system is generally used where the others system of drug administration fails.

Topical drug delivery can be defined as the application of drug containing formulation to the skin to directly treat cutaneous disorders (e.g acne) or the cutaneous mainfestations of a general disease (e.g psoriasis) with the intent of confining the pharmacological or other effect of the drug to the surface of the skin or within the skin.

Topical drug delivery system include a large variety of pharmaceutical dosage form like semisolids, liquid preparation, sprays, and solid powders. Most widely used semisolid preparation for topical drug delivery includes gels, creams, and ointments.[1]

Emulsion

Emulsions are phases of two or more immiscible liquids. The one phase is dispersed into dispersed medium. Several types as oil in water (O/W), water in oil (W/O), oil in oil (O/O), micro-emulsions, double and multiple emulsions, mixed emulsions etc. for preparation and stability of emulsion the emulsifier is necessary. 3 Various factors could affect the process of emulsification, such as the nature of oil, emulsifier, the emulsifier concentration used, rpm, as well as, the temperature.[2]

Gels

Gels are constituted by entrapment of large amounts of aqueous or hydroalcoholic liquid in a network of colloidal solid particles, which may be inorganic or

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MICROWAVE ASSISTED SYNTHESIS OF BENZIMIDAZOLE AND ITS CHARACTERIZATION

Parag A. Lekurwale*, Manjusha P. Yeole and Mrunali A. Bhongade

Priyadarshini J. L. College of Pharmacy, Electronic Zone Building, MIDC, Hingna Road, Nagpur-440016.

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***Corresponding Author**
Parag A. Lerkurwale
Priyadarshini J. L. College of Pharmacy, Electronic Zone Building, MIDC, Hingna Road Nagpur-440016.

1. INTRODUCTION

Microwave technology opens up new opportunities to the synthetic chemist in the form of new reactions that are not possible using conventional heating. The interest in the microwave assisted organic synthesis has been growing during the recent years.[1-2]

The short reaction times provided by microwave synthesis make it ideal for rapid reaction scouting and optimization of reaction conditions, allowing very rapid progress through the hypotheses–experiment–results iterations, i.e. finding the optimum conditions for a specific reaction to obtain the desired products in good yields and purities. Since many synthesis reactions require at least one or more heating steps for long time periods, these optimizations are often difficult and time- consuming.[3]

Microwave-assisted heating under controlled conditions has been shown to be a valuable technology for any application that requires heating of a reaction mixture, since it often dramatically reduces reaction times – typically from days or hours to minutes or even seconds. Compounds can therefore be rapidly synthesized in either a parallel or (automated) sequential way using this new promising technology.[4]

Microwave-assisted organic synthesis has revolutionized organic synthesis. Small molecules can be built in a fraction of the time required by classical thermal methods. As a result, this technique has rapidly gained acceptance as a valuable tool for accelerating drug discovery and development processes.[5]

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A REVIEW ON SOLID DISPERSION AND IT'S APPLICATION

Ravina N. Pounikar*, Dr. Mrs. Suparna S. Bakhale, Jayshree V. Motghare, Anuja Bhure, Madhav Korde

Department of Pharmaceutics, Priyadarshini J.L. College of Pharmacy, Electronic Zone Building, Nagpur, Maharashtra, India-440016.

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***Corresponding Author**
Miss. Ravina N. Pounikar
Department of Pharmaceutics, Priyadarshini J.L. College of Pharmacy, Electronic zone building, Nagpur, Maharashtra, India-440016.

ABSTRACT

Poor solubility of drugs is a major challenge in the formulation development. Solid dispersion is introduced as a novel means for enhancement of solubility. Solid dispersion may be defined as a set of solid products comprising of at least two diverse components, usually hydrophilic matrix and hydrophobic drug. Depending on nature of carriers the immediate release solid dispersions and/or controlled release solid dispersions can be formulated. This matrix may be crystalline or amorphous in nature. As per biopharmaceutical classification system class II drugs are with low solubility and high permeability and are the promising candidates for improvement of solubility as well as bioavailability by means of solid dispersion. The carriers used previously were mostly synthetic one. Recent trend towards the use of natural carriers have replaced the use of synthetic carriers. This review is the overview of various synthetic, natural, semisynthetic, modified natural hydrophilic carriers used for formulation of solid dispersions. Since a solid dispersion is basically a drug–polymer two-component system, the drug– polymer interaction is the determining factor in its design and performance. In this review, we summarize our current understanding of solid dispersions both in the solid state and in dissolution, emphasizing the fundamental aspects of this important technology Practical aspects pertaining to preparation of solid dispersions, like the selection of carrier, drugs molecular arrangement in these preparations are discussed in this article. Proposed article highlights the various preparation techniques of solid dispersion, characterization, available recent technologies, marketed preparation, future prospective etc.

KEYWORDS:

INTRODUCTION

The simple and easy way of administration of the drug is through oral route. The oral dosage forms have many benefits compared to other dosage forms like greater stability, accurate dosage, smaller bulk and ease of production. The oral route has been considered as most common and preferred route owing to convenience and easy administration. As a patient's prospect, swallowing a dosage form is a comfortable means of taking medication.[1,2] Solubility is a major challenge for certain drugs to develop a suitable formulation for administration of drugs orally like Griseofulvin, Digoxin, Phenytoin, Sulphathiazole and Chloramphenicol. With the recent advent of high-throughput screening of potential therapeutics, the numerous drug candidates with poor solubility have increased severely and their formulation for oral delivery poses great challenge to formulation scientists in the pharmaceutical industry.[3,4] Major problem encountered during oral delivery of certain active agents is poor bioavailability due to inadequate drug absorption. Therefore, pharmaceutical research is mainly focused on two prime areas: first to improve the oral bioavailability of active agents including solubility enhancement and dissolution rate of poorly water-soluble drugs and secondly to enhance the permeability of poorly permeable drugs. In the Biopharmaceutical Classification System (BCS) (table 1) drugs with high membrane permeability and low aqueous solubility are categorized as Class II drugs. Therefore, solid dispersion (SD) technologies are particularly useful in the improvement of oral absorption as well as the bioavailability of BCS class II drugs.[5]

Table no. General BCS for orally administered drugs.

BCS Class	Solubility	Permeability
BCS 1	High	High
BCS 2	Low	High
BCS 3	High	Low
BCS 4	Low	Low

Solubility

The Solubility is the property of a liquid, solid, or gaseous chemical substance called solute to dissolve in a liquid, solid, or gaseous solvent to obtain a homogeneous solution of the solute in the solvent. The solubility of any substance basically depends on the solvent used in temperature and pressure as shown in (table 2).[6]

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EMULGEL: POTENTIAL DRUG DELIVERY SYSTEM FOR TOPICAL DOSAGE FORM

Jayshree V. Motghare*, Dr. Mrs. Suparna S. Bakhale, Ravina Pounikar, Anuja Bhure, Madhav Korde

Department Of Pharmaceutics, Priyadarshini J.L. College of Pharmacy, Electronic Zone Building, Nagpur, Maharashtra, India-440016.

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***Corresponding Author**
Jayshree Vilas Motghare
Department of Pharmaceutics, Priyadarshini J.L. College of Pharmacy, Electronic zone building, Nagpur, Maharashtra, India-440016.

ABSTRACT

Emulgel have emerged as one of the most interesting topical delivery systems as it has dual control release system i.e., gel and emulsion. The topical applications of the drug offer the potential advantages of delivering the drug directly to the site of action and secondly delivering the drug for extended period of time at the effected site that mainly acts at the related regions. Emulgel have emerged as a promising drug delivery system for the delivery of hydrophobic drug. In comaprision among the other groups of semisolid preparations, the use of gels has been emerged both in cosmetics, and in pharmaceutical preparations because of its unique array of features. The use of gels and emulsions as combined dosage form results into formulation of emulgel. Emulgel is used to treat aches and pains caused by colds, headaches, muscle aches, backaches. The use of emulgels can be expanded in analgesics, anti-inflammatory, anti-fungal, anti-acne drugs. This review gives knowledge about emulgel including its properties, advantages, formulation considerations, and its recent advances in research field.

INTRODUCTION

Topical drug administration is simplest and easiest route of localized drug delivery anywhere in the body by routes as ophthalmic, rectal, vaginal and skin. These are applied as wide spectrum of preparations in case of both cosmetic and dermatological, to the healthy or diseased skin.[1]

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NANOBURRS: A NOVEL APPROACH IN THE TREATMENT OF ATHEROSCLEROSIS AND CVS DISEASE

Madhav Korde*, Suparna Bakhle and Tejaswina Fulzele

Department of Pharmaceutics, Priyadarshini J.L. College of Pharmacy, Electronic Zone Building, Nagpur, Maharashtra, India-440016.

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***Corresponding Author**
Madhav Korde
Department of Pharmaceutics, Priyadarshini J.L. College of Pharmacy, Electronic Zone Building, Nagpur, Maharashtra, India-440016.

ABSTRACT

The field of nanotechnology has crossed significant milestones from the systemic delivery of nanomedicines. However the ability to achieve spatiotemporal control may be essential to many medicinal applications. Nanotechnology has created a new horizon in diagnostic as well as therapeutic areas spreading itself to even molecular levels because of its adaptability for success at atomic scale. Several delivery systems are being proposed worldwide over the last several years. Nanosystems include dendrimers, magnetic nanoparticle, liposomes, quantum dots, nanoburrs employed for the purposes like targeting cancer cells, tissue imaging, cancer therapy, virus detection, noninvasive vaccine delivery etc. We continue with advanced uses like nanoburrs here, which are nanoparticles coated with a sticky protein that make them cling onto artery walls while they slowly release drugs. This paper suggests nanotechnology has tremendous implications in the development of future both human medicine and veterinary treatment, and finds it to be hugely applicable both today and in the future. This review brings about the working and applications of nanoburrs.

KEYWORDS: Nanotechnology, Nanoburrs, Nanoparticles, Cardiovascular Diseases, Atherosclerosis, CREKA Targeting micelles.

1. INTRODUCTION

Nanoburrs are tiny particles that travel through the bloodstream and attach to affected arteries where they deliver medicine directly to damaged tissue. Nanoburrs are coated with tiny protein fragments that allow them to stick to damaged arterial walls. Once tuck, they can release drugs (such as paclitaxel, which inhibits cell division and helps to prevent the growth

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Review Article

A comprehensive review on current strategies and developments in treatment of skeletal muscle atrophy

Shubhada V Mangrulkar[1,*], Dinesh Chaple[2], Sukanya Korewar[1], Priyanka Mazumdar[1], Twinkle Charde[1]

[1]*Dept. of Pharmacology, Priyadarshini J L College of Pharmacy Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur, Maharashtra, India*

[2]*Dept. of Pharmaceutical Chemistry, Priyadarshini J L College of Pharmacy Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur, Maharashtra, India*

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ABSTRACT

Background: Skeletal muscle atrophy is most remarkable example of multiple changes in physiological state and leads to morbidity. The predominance of skeletal muscle atrophy and the effect of this issue on the patient and family underscore the requirement for effective treatment strategies. Skeletal muscle has the capability of restoration after injury but can be evoked by various pathological conditions.

Main body: Treatments that can increase muscle mass and physical performance might be a promising alternative. The aim of review is to give comprehensive overview over the epidemiology of current potential treatment strategies of muscle atrophy. This review is focused on various treatments strategies like herbal treatment, synthetic drugs, physical therapy, focused ultrasound therapy, and emerging medication etc. which promotes skeletal muscle repair and functional regeneration.

Conclusion: The fact is that the reported drugs are not efficiently targeting every proteolytic system. There is the need for combinational treatment and developing a novel approach to treat skeletal muscle wasting.

1. Introduction

Skeletal muscle is the most abundant tissue in human body, which has the ability of rejuvenation up to the certain threshold of injury. Muscle atrophy is one of the social problem detected. Muscle atrophy is the loss of muscle mass fiber and its strength which losses its capability of regeneration after muscle injuries like high energy traffic accidents, blast distress, combat injuries, surgical and orthopedic situations, etc.[1] Many pathological conditions like cachexia, diabetes, sepsis, starvation, metabolic acidosis, chronic kidney disease, immobilization, obesity etc. leads to muscle atrophy.[2] There is imbalance between catabolic and anabolic signaling pathways.[3] The increased prevalence of muscle atrophy is observed over the population due to age, metabolic disorders and changed lifestyle many peoples of rural and urban are in misery with muscle atrophy.[4]

Various pathological conations alters the anabolic and catabolic signaling pathways. In muscle, IGF-1 is stimulated by mechanical stacking and contraction to which IGF receptor (IGFR) is activated in the cell to allow for membrane bound protein signaling pathways to become active. IGF-1 is secreted from muscle fibers into the extracellular matrix (ECM) to which it is bound by IGF binding proteins (IGFBPs). 18135–18140. The half-life of IGF-1 is just 5–10 min, these pools of IGFBPs must be local to the ECM. Upon binding to IGFBPs, IGF-1 stimulates its receptor to which intracellular signaling processes driving MPS can occur.[5] GF-1 enters the cell via IGFR, it triggers phosphoinositide 3-kinase (P13-K) to generate phosphatidylinositol -bisphosphate (PIP2), leading to the production of phosphatidylinositol 3, 4, 5-trisphosphate

* *Corresponding author.*
E-mail address: shubhadamangrulkar@gmail.com (S. V. Mangrulkar).

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Research Article

Formulation and Evaluation of Vitamin E Enriched Cold Cream with Almond oil as an Internal Phase

Varsha Barethiya*, Abhijeet Kukde, Ashish Badwaik, Dr. Alpana Asnani, Dr. Gouri Dixit
Department of Pharmaceutics, Priyadarshini J.L.College of Pharmacy, Hingna Road, Nagpur-440016, Maharashtra, India.
***Corresponding author's E-mail:** varshabarethiya@gmail.com

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ABSTRACT

The aim of the present study is to formulate and evaluate cold cream enriched with vitamin E and almond oil providing moisturizing effect. The cold cream was prepared by incorporating beeswax, borax, sweet almond oil, vitamin E and all other excipients. Fusion method is used for the formulation of the cold cream. Five different formulations are prepared and evaluated for the compliance with the pharmacopoeial parameters. All the prepared formulations are evaluated for the various parameters like pH, color, homogeneity test, viscosity, rheological studies, stability studies, etc. Among all the formulations, F4 shows the best result and all the parameters comply with the IP standards. Stability studies proved that there are no significant changes in the formulated cold cream. Thus, it is concluded that the vitamin E enriched cold cream is well formulated and evaluated with almond oil as an internal phase.

Keywords: cold cream, sweet almond oil, rheological studies, stability studies, homogeneity.

INTRODUCTION

In the pharmaceutical markets, several dosage forms are designed and introduced by considering the patient needs to obtain more patient compliance and providing faster relief. All the dosage forms are having best properties and also some drawbacks are associated with it. Over the last years the treatment of illness has been accomplished by administering drugs to human body via various routes namely oral, sublingual, rectal, parental, topical, inhalation, etc. Among all the dosage form, for the topical application, creams are considered as superior over other dosage forms. Topical delivery can be defined as the application of a drug containing formulation to the skin to directly treat cutaneous disorder or the cutaneous manifestations of a general disease (e.g. psoriasis) with the intent of containing the pharmacological or the effect of drug to the surface of the skin or within the skin semi-solid formulations in all their diversity dominate the system for topical delivery, but foams, sprays, medicated powders, solutions and even medicated adhesive systems are in use.[1]

Cream is a topical preparation used for application to the skin where it gets absorbed through the various layer of the skin and it can also apply on the body parts such as face, hands, legs, skin etc. Creams are defined as, the semisolid dosage forms containing one or more medicinal substances dissolved or dispersed in suitable bases to form a homogenous mass. This term has traditionally been applied to semisolids that possess a relatively fluid consistency formulated as either water-in-oil (e.g. cold cream) or oil-in-water (e.g. vanishing cream) emulsions. Creams are considered as pharmaceutical products and cosmetic products as per their application. Medicated creams are the creams containing the medicinal substances and used to treat the skin related disorders. Un medicated creams are highly used in a variety of skin conditions (dermatoses) but they are not containing any medicinal substances. The use of the fingertip unit concept found to be helpful in guiding how much amount of topical cream is required to cover different areas.

The term has been restricted to products consisting of oil-in-water emulsions or aqueous microcrystalline dispersions of long-chain fatty acids or alcohols that are water washable and more cosmetically and aesthetically acceptable. Creams are used for the multiple purposes like to enhance beauty, to get therapeutic effect, to relieve sun burn, and moisturized skin, as a makeup base, etc. Medicated creams are used for treating various skin related conditions such as psoriasis, dermatitis, burns, vaginal infections (e.g. Triple Sulfa Vaginal Cream), dry skin, etc. Galen, a Greek doctor, discovered the cold cream and in the second century, he prepared the formulation of cold cream which was popularly known as 'Galen's cream'. He prepared the formulation by using an emulsion water and beeswax along with rose petals as the vital moisturizer ingredients of the cold cream. Cold creams not only moisturize the skin but are also used for removing makeup and temporary tattoo marks. The cream is rubbed on tattoo marks and then erased with a cotton ball. Cold cream uses are also associated with preparation of facial paints for kids.

Cold cream is useful for keeping the skin moisturized and emollient all the time, especially all through the winters by protecting the skin from becoming dry and avoids aggravation of skin problems during the cold season. It stretches and then faint lines of crack develop over lips and cheeks. If proper care is not taken, these cracks may further become red. A plethora of cold creams are seen

Synthesis, physicochemical characterization and analgesic evaluation of some new thieno [*2,3-D*] Pyrimidin 4(3*H*) one derivatives

Dinesh P Kawade[1*], Dinesh R Chaple[2], Pramod B Khedekar[3]

[1]Associate Professor, [2]Professor and Principal, [3]Professor, [1,2]Dept. of Pharmaceutical Chemistry, [3]Dept. of Pharmaceutical Sciences, [1,2]Priyadarshini J. L. College of Pharmacy, Nagpur, Maharashtra, [3]Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur, Maharashtra, India

***Corresponding Author: Dinesh P Kawade**
Email: drdinesh03@gmail.com

Abstract
A $POCl_3$ catalyzed, efficient, one-step and solvent-free synthesis of novel thieno [2,3-d] pyrimidin-4(3*H*)-one derivatives from 2-amino-4,5-substitutedthiophene-3-carbonitrile has been developed using various aliphatic acid under both conventional heating and microwave irradiation techniques. The formation of compounds was confirmed via elemental analysis and spectroscopic techniques like FTIR, ^{1}HNMR and mass spectroscopy. All synthesized compounds have been screened for their analgesic activity by using Eddy´s hot plate method. The synthesized compounds 2d, 2k and 2h showed good analgesic activity and compounds 2a, 2b, 2g and 2i showed moderate whereas remaining compounds possessed less analgesic activity compared with standard, Tramadol.

Keywords: $POCl_3$, Thieno[2,3-d]pyrimidin-4 (3*H*)-one, Analgesic activity, Eddy´s hot plate.

Introduction
Medication revelation is ceaseless and iterative process, which begin with the recognizable proof of lead atom of wanted natural activity (lead age and closures with the streamlining of this lead (lead advancement) for choice of new hopeful particle in sedate improvement.[1] The attention to synthetic, physical physiological, biochemical properties, receptor locales, SAR and stereochemistry and so on is extremely huge in sedate plan for the fruitful advancement of medication particle.[2] Since, sedate plan is a coordinated for building up the train which forecasts a time of adjusted medication, a medication lacking symptom. It looks to clarify impacts of natural structure or its physicochemical properties included.[3] It examines the procedures by which the medication s delivered their belongings; how they respond with the cellular material of inspire a specific pharmacological impact or reaction. How they changed or detoxified, used or disposal by living being.[4] These ideas are the building stones whereupon the structure of medication configuration in assembled. The various new advancements have been created and connected in tranquilize innovative work (R&D) to abbreviate the examination cycle and to decrease the costs[5]. Among them, computational methodologies have upset the pipeline of disclosure and advancement over the most recent 40 year, computational advances for medicate R&D have advanced rapidly, particularly in late decades with the extraordinary improvement of science, biomedicine, and PC ability.[6] The computational instruments have been connected in relatively every phase of medication R&D, which have incredibly changed the system of medication disclosure.[7] Aggravation is a neighborhood response of the vascular and supporting components of a tissue to damage bringing about the arrangement of protein-rich exudates; it is defensive reaction of the non particular insusceptible framework that serve to limit, kill, or to crush a harmful operator in planning for the way toward recuperating. The indication of aggravation are rubor (redness), calor (warm), dolor (pain), tumor (swelling), and functio lasea (loss of function).[8] Agony is an attributes neurophysical sensation emerging from a harmful boost.[9] It is isolated into integumental agony (i.e. shallow, identified with skin, muscle and joints) and instinctive torment (i.e Deep situated, related to heart, stomach, kidney and rankle bladder). Nonsteroidal calming drug and broadly utilized for the treatment of different incendiary infections and also to remember the hurts and agony.[10] They apply their restorative impact through down control of prostaglandin blend by restraining the rate restricting cyclooxygenase (COX) catalyst engaged with the provocative course.[11] Despite the fact that this medication are for the most part all around endured in understanding with joint condition, a high frequency of gastrointestinal symptom, for example, mucosal injury, discharge, and ulceration has been a significant issue in their medicine. These present helpful insufficiencies force the need to create more secure medication.[12]

An analgesics or painkillers are 'agents that relieve pain by elevating the pain threshold without disturbing consciousness or altering sensory-modalities'. Besides 'pain' may also be defined in psychological perspective as –'a particular type of sensory experience distinguished by nerve tissue from sensations, such as: touch, heat, pressure and cold.[13]

Thiophene containing compounds are well known to exhibit various biological effects. Heterocycles containing the thienopyrimidine moiety are of curiosity because of their intresting pharmacological and biological activities.[20-22] They bear structural analogy and isoelectronic relation to purine and several substitutedthieno[2,3-*d*] pyrimidine derivatives shown to exhibit prominent and versatile biological activities.[23-24] Over the last two decades, many thienopyrimidines have been found to exhibit a variety of synthesized as potencial anticancer,[25] analgesic,[26] antimicrobial[27,28] and antiviral agents.[29]

Review Article

Dissolution - A Quality Parameter for Testing of Pharmaceutical Dosage Form

Kusum Rajbhar[1]*, Yogita Jain[1], Varsha Barethiya[1], Shanu Sahu[1], Dr. Mrs. Gouri R. Dixit[2]
[1] Research scholar- Department of Pharmaceutics, Priyadarshini J.L. College of Pharmacy, Nagpur, India.
[2] Assistant Professor- Department of Pharmaceutics, Priyadarshini J.L. College of Pharmacy, Electronic zone building, Nagpur, Maharashtra, India.
***Corresponding author's E-mail:** kusumrajbhar02@gmail.com

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ABSTRACT

In the pharmaceutical industry, dissolution study is one of the vital tests for the evaluation of the pharmaceutical dosage form. Dissolution test is the most important tool for the testing of drug release profile of solid dosage form in the pharmaceutical preparation. Dissolution studies provide the knowledge about the efficacy of the dosage form. Dissolution tests are major for performing a various kind of investigations like drug degradation profiles, stability and shelf life studies, chemical stability and so on. Dissolution test can be easily performed in both the small and large scale with the proper techniques and it is also used for the comparison between the graph profile of the similar and different dosage form. Hence, it can be considered as the most qualitative and convenient test for the evaluation of the pharmaceutical solid dosage form.

Keywords: Dissolution, similarity factor, biopharmaceutical class, validation.

INTRODUCTION

Dissolution testing is a basic tool which is broadly used in the development of another pharmaceutical product. The test, in its most direct structure, consists of placing the formulation in a dissolution apparatus containing reasonable dissolution medium, allowing it to dissolve over a specified period of time and then assaying the resultant solution using appropriate analytical method to determine the measure of medication. Dissolution tests are significant for a variety of investigations like medication degradation profiles, stability and shelf life studies, physical and mechanical testing of dosage forms, upcoming QC testing on raw materials etc.

In-vitro dissolution testing serves as a significant tool for characterizing the biopharmaceutical quality of a product for additional turn of events and for evaluation of active ingredients/drug substances. In-vitro dissolution data are supportive in the evaluation and interpretation of potential risks, mainly in the case of controlled/modified-release dosage forms - for example as regards dose dumping, food impacts on bioavailability or interaction with other medications, which impact gastrointestinal environmental conditions. Biopharmaceutical aspects are as significant for stability concerns as they are for batch release after production, in-vitro dissolution being of high relevance in quality control and quality assurance. Last but not least, in-vitro dissolution information will be vital when assessing changes in production site, manufacturing procedure or formulation and assist in decisions concerning the requirement for bioavailability studies.

None of these purposes can be satisfied by an in-vitro test system without sufficient reliability. Reliability here would be characterized as the system being experimentally sound, yielding precise, accurate, repeatable outcomes and with adequate information on the in-vivo significance of the dissolution data obtained. Prerequisites for dissolution testing have been assessed in the literature. Since in-vitro dissolution is a physical test, characterized by convention and is of a destructive nature, proving reliability requires exceptional consideration. It therefore is within the scope of these Guidelines to characterize appropriate testing equipment and experimental design as well as to suggest the background for adequate physical and analytical validation, along with verification procedures according to the state of biopharmaceutical science. The Guidelines are primarily devoted to solid oral products. However, the general ideas may be adapted to in-vitro dissolution analysis of drug materials/powders, semisolid oral products, suppositories and, with distinctive limitations, to other non-oral products. [1-3]

History

The study of the dissolution procedure has been established since the end of the 19th century by physical chemists. Therefore, most of the important research in the field was not related to medications at all, and the basic laws for the depiction of the dissolution procedure were already available when interest in drug dissolution started to increase. In spite of the advances in vitro dissolution in chemical engineering sciences, in the pharmaceutical sciences the idea was not utilized broadly until the early 1950s.Until then the in vivo availability of the drug was thought to be determined exclusively by the disintegration of the tablet. For orally administered non-solution dosage forms, in vitro performance test procedures such as dissolution and disintegration are

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FORMULATION AND EVALUATION OF HERBAL TEA

Meera A. Ingale*, Dr. Gouri R. Dixit, Dr. Dinesh R. Chaple and Rohit T. Durge

Priyadarshini J. L. College of Pharmacy, Electronic Zone Building, MIDC, Hingna Road, Nagpur-440016, Maharashtra, India.

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***Corresponding Author**
Meera A. Ingale
Priyadarshini J. L. College of Pharmacy, Electronic Zone Building, MIDC, Hingna Road, Nagpur-440016, Maharashtra, India.

ABSTRACT

Herbal tea is essentially an herbal mixture made from leaves, seeds and/ or roots of various plants. As per popular misconception, they are not derived from the usual tea plants, but rather from what are called as 'tisanes'. There are several kinds of tisanes (herbal teas) that have been used for their medicinal properties. Some of them being consumed for its energizing properties to help induce relaxation, to curb stomach or digestive problems and also strengthen the immune system. Some of the popular herbal teas are Green tea, Star anise tea, Ginger tea, Tulsi tea, Cinnamon tea, Turmeric tea, Lemon grass tea, Cardamom tea, Stevia tea etc. Some of these herbal teas possess extremely strong medicinal benefits such as, Green tea is a 'non-fermented' tea, and contains more catechins, than black tea or oolong tea. Catechins are in vitro and in vivo strong antioxidants. In addition, its content of certain minerals and vitamins increases the antioxidant potential of this type of tea. Recent human studies suggest that green tea may contribute to a reduction in the risk of cardiovascular disease and some forms of cancer, as well as to the promotion of oral health and other physiological functions such as anti-hypertensive effect, body weight control, antibacterial and antiviruses activity.

KEYWORDS: Tisanes, Herbal tea, Herbal remedies, Herbal medicine.

INTRODUCTION

Herbal Tea, according to many, look like tea and is brewed as the same way as tea, but in reality, it is not considered a tea at all. This is due to the fact that they do not originate from the *Camellia sinensis* bush, the plant from which all teas are made.[1] Herbal teas are actually mixtures of several ingredients, and are more accurately known as 'tisanes.' Tisanes are made

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A COMPREHENSIVE REVIEW ON EMULGEL: A NEW APPROACH FOR ENHANCED TOPICAL DRUG DELIVERY

Rani J. Rode*, Gouri R. Dixit, Kanchan P. Upadhye, Suparna S. Bakhle and Rohit T. Durge

Department of Pharmaceutics, Priyadarshini J. L. College of Pharmacy, Nagpur -440016 Dist. Nagpur (M. S.) India.

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***Corresponding Author**
Rani J. Rode
Department of Pharmaceutics, Priyadarshini J. L. College of Pharmacy, Nagpur -440016 Dist. Nagpur (M. S.) India.

ABSTRACT

Emulgel is a new approach and recent technology of NDDS for topical drug transport having characteristics of dual controlled release i.e emulsion and gel Emulsion used for treating for muscle pain, headache, acne, psoriasis, rheumatoid arthritis. When emulsion and gel used in combination its known as Emulgel. Emulgel is transparent gel which is used in pharmaceutical and cosmetic product. Emulgel overcome the problem which is come in gel and emulsion. Gel is a new class of formulation, gel release drug faster in comparison of ointment, cream, lotion etc. Limitation of gel in the delivery of hydrophobic drug through the skin. Overcome the limitation on emulsion based approach is being used so that even a hydrophobic therapeutic moiety can exhibit the unique properties of gels. Emulgel is prepared by different polymers which act as an emulsifying agent and thickening agent because the gelling capacity of these polymers give rise to stable emulsions by decreasing interfacial and surface tension while at the same time increasing the viscosity of the aqueous phase. Emulgel are having major advantages on novel vesicular systems as well as on conventional systems considering various aspects. The emulgel provide several favourable properties for its dermatological use such as greaseless, thixotropic, easily spreadable, emollient, easily removable, non-staining, water soluble, longer shelf life, transparent, bio-friendly and pleasing appearance.

KEYWORDS: Emulgel, Emulsion based gel, Hydrophobic drugs, Topical drug delivery system, novel drug delivery.

INTRODUCTION

Topical drug administration is simplest and easiest route of localized drug delivery anywhere in the body by routes as ophthalmic, rectal, vaginal and skin. These are applied as wide spectrum of preparations in case of both cosmetic and dermatological, to the healthy or diseased skin. Topical drug delivery can be defined as the application of a drug containing formulation to the skin to treat cutaneous disorder directly. The topical drug delivery system is generally used where other routes (like oral, sublingual, rectal, parental) of drug administration fails or in local skin infection like a fungal infection. The main advantage of the topical delivery system is to bypass first pass metabolism. Avoidance of the risks and inconveniences of intravenous therapy and of the varied conditions of absorption, like pH changes, the presence of enzymes, gastric emptying time are another advantage of The topical drug delivery system is generally used where the others system of drug administration fails.

Topical drug delivery can be defined as the application of drug containing formulation to the skin to directly treat cutaneous disorders (e.g acne) or the cutaneous mainfestations of a general disease (e.g psoriasis) with the intent of confining the pharmacological or other effect of the drug to the surface of the skin or within the skin.

Topical drug delivery system include a large variety of pharmaceutical dosage form like semisolids, liquid preparation, sprays, and solid powders. Most widely used semisolid preparation for topical drug delivery includes gels, creams, and ointments.[1]

Emulsion

Emulsions are phases of two or more immiscible liquids. The one phase is dispersed into dispersed medium. Several types as oil in water (O/W), water in oil (W/O), oil in oil (O/O), micro-emulsions, double and multiple emulsions, mixed emulsions etc. for preparation and stability of emulsion the emulsifier is necessary. 3 Various factors could affect the process of emulsification, such as the nature of oil, emulsifier, the emulsifier concentration used, rpm, as well as, the temperature.[2]

Gels

Gels are constituted by entrapment of large amounts of aqueous or hydroalcoholic liquid in a network of colloidal solid particles, which may be inorganic or

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MICROWAVE ASSISTED SYNTHESIS OF BENZIMIDAZOLE AND ITS CHARACTERIZATION

Parag A. Lekurwale*, Manjusha P. Yeole and Mrunali A. Bhongade

Priyadarshini J. L. College of Pharmacy, Electronic Zone Building, MIDC, Hingna Road, Nagpur-440016.

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***Corresponding Author**
Parag A. Lerkurwale
Priyadarshini J. L. College of Pharmacy, Electronic Zone Building, MIDC, Hingna Road Nagpur-440016.

1. INTRODUCTION

Microwave technology opens up new opportunities to the synthetic chemist in the form of new reactions that are not possible using conventional heating. The interest in the microwave assisted organic synthesis has been growing during the recent years.[1-2]

The short reaction times provided by microwave synthesis make it ideal for rapid reaction scouting and optimization of reaction conditions, allowing very rapid progress through the hypotheses–experiment–results iterations, i.e. finding the optimum conditions for a specific reaction to obtain the desired products in good yields and purities. Since many synthesis reactions require at least one or more heating steps for long time periods, these optimizations are often difficult and time- consuming.[3]

Microwave-assisted heating under controlled conditions has been shown to be a valuable technology for any application that requires heating of a reaction mixture, since it often dramatically reduces reaction times – typically from days or hours to minutes or even seconds. Compounds can therefore be rapidly synthesized in either a parallel or (automated) sequential way using this new promising technology.[4]

Microwave-assisted organic synthesis has revolutionized organic synthesis. Small molecules can be built in a fraction of the time required by classical thermal methods. As a result, this technique has rapidly gained acceptance as a valuable tool for accelerating drug discovery and development processes.[5]

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A REVIEW ON SOLID DISPERSION AND IT'S APPLICATION

Ravina N. Pounikar*, Dr. Mrs. Suparna S. Bakhale, Jayshree V. Motghare, Anuja Bhure, Madhav Korde

Department of Pharmaceutics, Priyadarshini J.L. College of Pharmacy, Electronic Zone Building, Nagpur, Maharashtra, India-440016.

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***Corresponding Author**
Miss. Ravina N. Pounikar
Department of Pharmaceutics, Priyadarshini J.L. College of Pharmacy, Electronic zone building, Nagpur, Maharashtra, India-440016.

ABSTRACT

Poor solubility of drugs is a major challenge in the formulation development. Solid dispersion is introduced as a novel means for enhancement of solubility. Solid dispersion may be defined as a set of solid products comprising of at least two diverse components, usually hydrophilic matrix and hydrophobic drug. Depending on nature of carriers the immediate release solid dispersions and/or controlled release solid dispersions can be formulated. This matrix may be crystalline or amorphous in nature. As per biopharmaceutical classification system class II drugs are with low solubility and high permeability and are the promising candidates for improvement of solubility as well as bioavailability by means of solid dispersion. The carriers used previously were mostly synthetic one. Recent trend towards the use of natural carriers have replaced the use of synthetic carriers. This review is the overview of various synthetic, natural, semisynthetic, modified natural hydrophilic carriers used for formulation of solid dispersions. Since a solid dispersion is basically a drug–polymer two-component system, the drug– polymer interaction is the determining factor in its design and performance. In this review, we summarize our current understanding of solid dispersions both in the solid state and in dissolution, emphasizing the fundamental aspects of this important technology Practical aspects pertaining to preparation of solid dispersions, like the selection of carrier, drugs molecular arrangement in these preparations are discussed in this article. Proposed article highlights the various preparation techniques of solid dispersion, characterization, available recent technologies, marketed preparation, future prospective etc.

KEYWORDS:

INTRODUCTION

The simple and easy way of administration of the drug is through oral route. The oral dosage forms have many benefits compared to other dosage forms like greater stability, accurate dosage, smaller bulk and ease of production. The oral route has been considered as most common and preferred route owing to convenience and easy administration. As a patient's prospect, swallowing a dosage form is a comfortable means of taking medication.[1,2] Solubility is a major challenge for certain drugs to develop a suitable formulation for administration of drugs orally like Griseofulvin, Digoxin, Phenytoin, Sulphathiazole and Chloramphenicol. With the recent advent of high-throughput screening of potential therapeutics, the numerous drug candidates with poor solubility have increased severely and their formulation for oral delivery poses great challenge to formulation scientists in the pharmaceutical industry.[3,4] Major problem encountered during oral delivery of certain active agents is poor bioavailability due to inadequate drug absorption. Therefore, pharmaceutical research is mainly focused on two prime areas: first to improve the oral bioavailability of active agents including solubility enhancement and dissolution rate of poorly water-soluble drugs and secondly to enhance the permeability of poorly permeable drugs. In the Biopharmaceutical Classification System (BCS) (table 1) drugs with high membrane permeability and low aqueous solubility are categorized as Class II drugs. Therefore, solid dispersion (SD) technologies are particularly useful in the improvement of oral absorption as well as the bioavailability of BCS class II drugs.[5]

Table no. General BCS for orally administered drugs.

BCS Class	Solubility	Permeability
BCS 1	High	High
BCS 2	Low	High
BCS 3	High	Low
BCS 4	Low	Low

Solubility

The Solubility is the property of a liquid, solid, or gaseous chemical substance called solute to dissolve in a liquid, solid, or gaseous solvent to obtain a homogeneous solution of the solute in the solvent. The solubility of any substance basically depends on the solvent used in temperature and pressure as shown in (table 2).[6]

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EMULGEL: POTENTIAL DRUG DELIVERY SYSTEM FOR TOPICAL DOSAGE FORM

Jayshree V. Motghare*, Dr. Mrs. Suparna S. Bakhale, Ravina Pounikar, Anuja Bhure, Madhav Korde

Department Of Pharmaceutics, Priyadarshini J.L. College of Pharmacy, Electronic Zone Building, Nagpur, Maharashtra, India-440016.

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***Corresponding Author**
Jayshree Vilas Motghare
Department of Pharmaceutics, Priyadarshini J.L. College of Pharmacy, Electronic zone building, Nagpur, Maharashtra, India-440016.

ABSTRACT

Emulgel have emerged as one of the most interesting topical delivery systems as it has dual control release system i.e., gel and emulsion. The topical applications of the drug offer the potential advantages of delivering the drug directly to the site of action and secondly delivering the drug for extended period of time at the effected site that mainly acts at the related regions. Emulgel have emerged as a promising drug delivery system for the delivery of hydrophobic drug. In comaprision among the other groups of semisolid preparations, the use of gels has been emerged both in cosmetics, and in pharmaceutical preparations because of its unique array of features. The use of gels and emulsions as combined dosage form results into formulation of emulgel. Emulgel is used to treat aches and pains caused by colds, headaches, muscle aches, backaches. The use of emulgels can be expanded in analgesics, anti-inflammatory, anti-fungal, anti-acne drugs. This review gives knowledge about emulgel including its properties, advantages, formulation considerations, and its recent advances in research field.

INTRODUCTION

Topical drug administration is simplest and easiest route of localized drug delivery anywhere in the body by routes as ophthalmic, rectal, vaginal and skin. These are applied as wide spectrum of preparations in case of both cosmetic and dermatological, to the healthy or diseased skin.[1]

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NANOBURRS: A NOVEL APPROACH IN THE TREATMENT OF ATHEROSCLEROSIS AND CVS DISEASE

Madhav Korde*, Suparna Bakhle and Tejaswina Fulzele

Department of Pharmaceutics, Priyadarshini J.L. College of Pharmacy, Electronic Zone Building, Nagpur, Maharashtra, India-440016.

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***Corresponding Author**
Madhav Korde
Department of Pharmaceutics, Priyadarshini J.L. College of Pharmacy, Electronic Zone Building, Nagpur, Maharashtra, India-440016.

ABSTRACT

The field of nanotechnology has crossed significant milestones from the systemic delivery of nanomedicines. However the ability to achieve spatiotemporal control may be essential to many medicinal applications. Nanotechnology has created a new horizon in diagnostic as well as therapeutic areas spreading itself to even molecular levels because of its adaptability for success at atomic scale. Several delivery systems are being proposed worldwide over the last several years. Nanosystems include dendrimers, magnetic nanoparticle, liposomes, quantum dots, nanoburrs employed for the purposes like targeting cancer cells, tissue imaging, cancer therapy, virus detection, noninvasive vaccine delivery etc. We continue with advanced uses like nanoburrs here, which are nanoparticles coated with a sticky protein that make them cling onto artery walls while they slowly release drugs. This paper suggests nanotechnology has tremendous implications in the development of future both human medicine and veterinary treatment, and finds it to be hugely applicable both today and in the future. This review brings about the working and applications of nanoburrs.

KEYWORDS: Nanotechnology, Nanoburrs, Nanoparticles, Cardiovascular Diseases, Atherosclerosis, CREKA Targeting micelles.

1. INTRODUCTION

Nanoburrs are tiny particles that travel through the bloodstream and attach to affected arteries where they deliver medicine directly to damaged tissue. Nanoburrs are coated with tiny protein fragments that allow them to stick to damaged arterial walls. Once tuck, they can release drugs (such as paclitaxel, which inhibits cell division and helps to prevent the growth

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Review Article

A comprehensive review on current strategies and developments in treatment of skeletal muscle atrophy

Shubhada V Mangrulkar[1,*], Dinesh Chaple[2], Sukanya Korewar[1], Priyanka Mazumdar[1], Twinkle Charde[1]

[1]*Dept. of Pharmacology, Priyadarshini J L College of Pharmacy Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur, Maharashtra, India*
[2]*Dept. of Pharmaceutical Chemistry, Priyadarshini J L College of Pharmacy Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur, Maharashtra, India*

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ABSTRACT

Background: Skeletal muscle atrophy is most remarkable example of multiple changes in physiological state and leads to morbidity. The predominance of skeletal muscle atrophy and the effect of this issue on the patient and family underscore the requirement for effective treatment strategies. Skeletal muscle has the capability of restoration after injury but can be evoked by various pathological conditions.
Main body: Treatments that can increase muscle mass and physical performance might be a promising alternative. The aim of review is to give comprehensive overview over the epidemiology of current potential treatment strategies of muscle atrophy. This review is focused on various treatments strategies like herbal treatment, synthetic drugs, physical therapy, focused ultrasound therapy, and emerging medication etc. which promotes skeletal muscle repair and functional regeneration.
Conclusion: The fact is that the reported drugs are not efficiently targeting every proteolytic system. There is the need for combinational treatment and developing a novel approach to treat skeletal muscle wasting.

1. Introduction

Skeletal muscle is the most abundant tissue in human body, which has the ability of rejuvenation up to the certain threshold of injury. Muscle atrophy is one of the social problem detected. Muscle atrophy is the loss of muscle mass fiber and its strength which losses its capability of regeneration after muscle injuries like high energy traffic accidents, blast distress, combat injuries, surgical and orthopedic situations, etc.[1] Many pathological conditions like cachexia, diabetes, sepsis, starvation, metabolic acidosis, chronic kidney disease, immobilization, obesity etc. leads to muscle atrophy.[2] There is imbalance between catabolic and anabolic signaling pathways.[3] The increased prevalence of muscle atrophy is observed over the population due to age, metabolic disorders and changed lifestyle many peoples of rural and urban are in misery with muscle atrophy.[4]

Various pathological conations alters the anabolic and catabolic signaling pathways. In muscle, IGF-1 is stimulated by mechanical stacking and contraction to which IGF receptor (IGFR) is activated in the cell to allow for membrane bound protein signaling pathways to become active. IGF-1 is secreted from muscle fibers into the extracellular matrix (ECM) to which it is bound by IGF binding proteins (IGFBPs). 18135–18140. The half-life of IGF-1 is just 5–10 min, these pools of IGFBPs must be local to the ECM. Upon binding to IGFBPs, IGF-1 stimulates its receptor to which intracellular signaling processes driving MPS can occur.[5] GF-1 enters the cell via IGFR, it triggers phosphoinositide 3-kinase (P13-K) to generate phosphatidylinositol -bisphosphate (PIP2), leading to the production of phosphatidylinositol 3, 4, 5-trisphosphate

* *Corresponding author*.
E-mail address: shubhadamangrulkar@gmail.com (S. V. Mangrulkar).

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