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1	Overview: Impact of Hydrogen Sulphide on Some Advanced Molecular Modulators Involved in Cardiac Hypertrophy	Shiv Kumar Kushawaha 1, 2*, Manish Sinha 1, Amar Deep Ankalgi1, Nripendra Singh3, Puneet Kumar4, Mahendra Singh Ashawat	Pharmacology	YMER	2022	0044-0477	0.1	http://www.ymerdigital.com/	http://ymerdigital.com/archives/?cpage=5&issId=%202108	UGC Care List & Scopus ✓
2	Review Article: Recent Advancement In Transdermal Drug Delivery System (Tdds)	Kajal, Dev Raj Sharma, Vinay Pandit, M.S. Ashawat	Pharmaceutics	Journal of Positive School Psychology	2022	2717-7564	http://journalppw.com	-----	SCOPUS
3	Review: Novel Drug Delivery for the Treatment of Osteoarthritis (OA)	Kajal, Dev Raj Sharma, Vinay Pandit, M.S. Ashawat	Pharmaceutics	International Journal of Innovative Science and Research Technology	2022	2456-2165	www.ijisrt.com	GOOGLE SCHOLAR

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Overview: Impact of Hydrogen Sulphide on Some Advanced Molecular Modulators Involved in Cardiac Hypertrophy

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Abstract:

Pressure overload (aortic stenosis) induced myocardial hypertrophy is allied with a poor prognosis in humans. It leads to the development of cardiac arrhythmias, diastolic dysfunction, and ultimately congestive heart failure. Heart failure is a global pandemic disease, affecting an estimated 26 million people worldwide and more than 4 million in India. This poses a huge burden to both individuals and society. However, there is limited knowledge regarding the underlying molecular mechanisms. Therefore, we hypothesized that the various cellular signaling pathway is playing a key role in myocardial hypertrophy. In this review, we were highlighting that drug-like H₂S can target these cellular signaling pathways and hold promise as a potential lead for therapeutic intervention. Furthermore, it includes the concerns associated with H₂S based therapy. In literature, clinical trials suggest that H₂S based therapy is beneficial in cardiac hypertrophy and other diseases. The realization of the biological importance of H₂S in numerous cells, tissues, and organs is now shedding light on the pathogenesis of various human diseases and paving the way for innovative therapeutic interventions.

Keywords: Aortic stenosis; cellular Signaling; H₂S; myocardial hypertrophy; Heart failure.

Review Article: Recent Advancement In Transdermal Drug Delivery System (Tdds)

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ABSTRACT:

TDDS is the best and easily self-administered system. It interacts with the skin and delivers the medicament in a controlled manner into the systemic circulation. It reduces/avoids the side effect related to oral therapy, like hepatic first-pass metabolism, GIT irritation, etc. The skin infusion enhancer technique has been advanced to improve the bioavailability of the drugs. So various Transdermal dosage forms have been prepared like: Transdermal patches, Gel, Cream, Ointments, etc. The Transdermal route is a viable option to enhance the variety of drugs. Transdermal drug delivery has become the primary route of delivery for a variety of medications that would otherwise be difficult to supply. There are some advantages to Transdermal medicine administration. Primarily to prevent first-pass metabolism and a stomach environment that would render the drug inactive in pharmaceuticals used to treat skin problems as well as for systemic effects to treat ailments of other organs. The therapy of hormone replacement, pain management, smoking cessation, neurological illnesses and angina pectoris like as Parkinson's ailment are all examples of Transdermal products and applications. Formulated to distribute the medicine into the systemic circulation at an optimal pace, it must stick to the skin for the desired period and not cause sensitization or skin irritation. By-passing first-pass metabolism to enhance bioavailability Keeping pharmacokinetic peaks and troughs to a minimum, Tolerance and dosage are being improved. In Continuous Delivery, increasing patient compliance is important.

KEYWORDS: Patches, Permeation, skin, stratum corneum, drug, Transdermal, delivery

INTRODUCTION:

Oral administration is the frequent method of medication distribution with significant demerits such as reduced bioavailability as a result of hepatic first-pass metabolism and a proclivity for causing oscillations in blood level (both for low and high). To address these issues, a novel drug delivery mechanism must be developed that avoids first-pass metabolism, reduces stomach discomfort, and boosts drug bioavailability. As a result, a

system for Transdermal drug delivery has been created..(1)

These are self-administered systems in which medications are distributed to the blood circulation through the skin in a controlled way.(2) Because only a few medications can be given through the skin and the topical formulation must remain intact with the skin surface, the use of Transdermal patches has recently been limited..(3)

The medicine is permeated through multiple layers of skin(as shown in fig(a)) by a different method

Review: Novel Drug Delivery for the Treatment of Osteoarthritis (OA)

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Abstract:- As people live longer, the prevalence of osteoarthritis has increased, making it the most frequent kind of arthritis. During osteoarthritis, tissue of cartilage on articular joints corrodes, causing pain and sometimes debilitating loss of function in patients. The most significant risk factor for osteoarthritis is getting older. Osteoarthritis, is the most common chronic joint illness, and becomes common nowadays as people become older. It disturbs the majority of people over 65 and is a main musculoskeletal reason of reduced mobility in the elderly. Because the particular molecular mechanisms behind the degradation of cartilage matrix and the development of OA are unknown, there are presently no viable therapies to slow the advancement of OA or prevent irreversible cartilage degradation other than total joint replacement surgery. The major molecular pathways involved in OA pathogenesis will be discussed in this study, as well as new insights into prospective molecular targets. Various Novel carrier are used to enhancement of drug delivery to the site of action.

Keywords:- Osteoarthritis(OA), Aging, Cartilage, Distruction, Nanocarrier.

I. INTRODUCTION

The most common category of disease arthritis is (OA) osteoarthritis(1). OA mainly disturbs the joints of the hip, knee and hand and is induced by articular cartilage deterioration and subsequent synovitis.(2). Obesity, genetic susceptibility, and joint injury are all responsible for the development of osteoarthritis(3).Osteoarthritis is most common causes of chronic impairment in older people(4). In many patients, functional impairment and discomfort can lead to depression and significant sadness (3). The disease's prevalence is expected to rise as the world population's lifespan lengthens.(5). It's a cartilage condition, which affects the smooth rubbery cushion that surrounds the joint's bones. (6).Osteoarthritis causes cartilage breakdown, which is linked to damage to the menisci and other joint components, as well as bone remodeling.

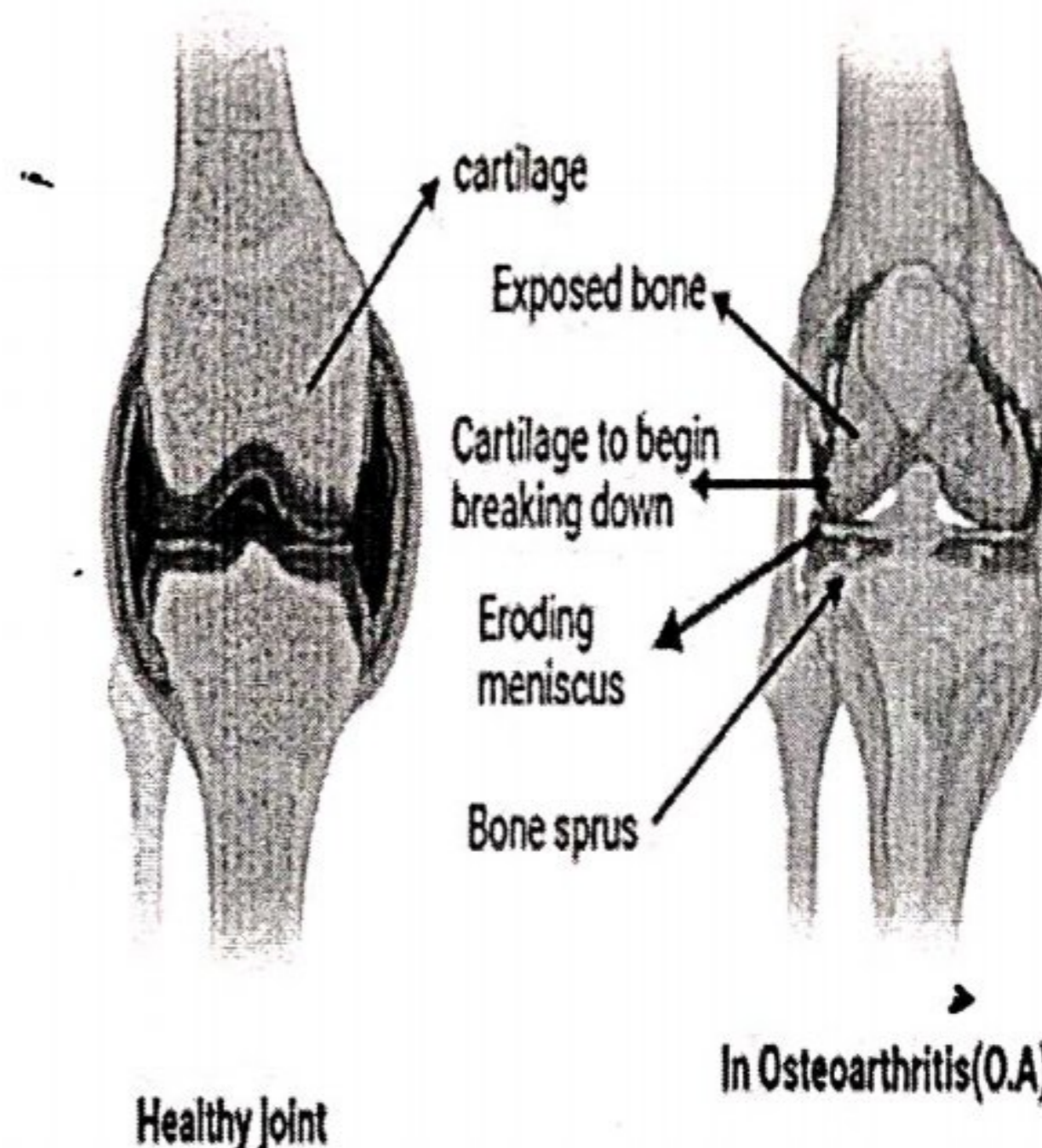


Fig. 1: Shows a normal/healthy joint and a joint affected with Osteoarthritis

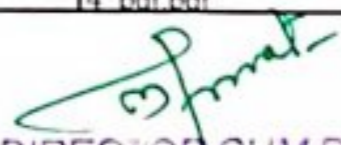
According to the 3rd Nutrition Examination and National Health Survey, approximately 37.4 percent of persons aged 60 and up in the United States had radiographic evidence of OA(7).OA is a primary musculoskeletal reason of reduced mobility in the old aged people, affecting joints such as knees, wrists, hips, and spine(8). While various risk factors for osteoarthritis have been proposed, such as genetic susceptibility, ageing, joint misalignment and obesity, the pathophysiology of osteoarthritis is still not clear(9). Stiffness, joint deformities, stiffness, chronic pain, radiographic joint space constriction and joint instability are the most common clinical complaints(10).

The risk factors of osteoarthritis have been identified as: Genetic, Susceptibility, Age, Obesity, Joint misalignment, and among others(11).

Clinical symptoms: Stiffness, joint deformities, stiffness, chronic pain, radiographic joint space narrowing, Redness(12).

List of Publication in 2021

S. No	Title of Paper	Name of the authors	Department of teacher	Name of Journal	Year of Publication	ISSN number	Impact Factor	Link to website of journal	Link to article/paper/abstract of the article	Is it listed in UGC care list/Scopus Web of Science/other, mention
1	Topical creams of pipenne loaded lipid nanocamers for management of atopoc dermatitis: development, characterization, and in vivo investigation using BALB/c mice	P Kumar, DK Sharma, MS Ashawat	Pharmaceutics	Journal of Liposomes Research	2021	1532-2394	2.455	https://www.tandfonline.com/doi/full/10.1080/08982104.2021.1880436	https://www.tandfonline.com/doi/full/10.1080/08982104.2021.1880436	Web of Science
2	Development of Phospholipids Vesicular Nanocamer for Topical Delivery of Tea Tree Oil in	Pravin Kumar, Dinesh Kumar Sharma, Mahendra Singh	Pharmaceutics	European Journal of Lipid Science and Technology	2021	1438-7697	2.46	http://www.interscience.wiley.com/jpages/1438-7697/	https://onlinelibrary.wiley.com/doi/abs/10.1002/ejlt.202100002	Web of Science
3	A REVIEW ON NANOSUSPENSION IN DRUG DELIVERY	Rahul Thakur, 1Dr. Abhishek Soni, 2Dr. Amit Chaudhary, 3Dr. Shubham Sharma	Pharmacy practice	International Journal of Research and Analytical Reviews (IJRAR)	2021		5.75	https://ijrar.org/	http://ijrar.org/viewfull.php?&p_id=IJRAR21C2088.pdf	UGC / google scholar
4	Preparation and Evaluation of Copper Nanoparticles Loaded Hydrogel For Burns	ASHISH KUMAR, VINAY PANDIT, UPENDRA NAGAICH	Pharmaceutics	International Journal of Applied Pharmaceutics	2021	0975-7058	0.82	https://innovareacademics.in/journals/index.php/ijap	https://www.researchgate.net/publication/350065684_PREPARATION_AND_EVALUATION_OF_COPPER_NANO_PARTICLES_LOADED	SCOPUS, UGC APPROVED
5	Topical methotrexate cubosomes in treatment of rheumatoid arthritis: Ex-Vivo and In-Vivo studies	Kanshma Kapoor, Vinay Pandit, Upendra Nagaich	Pharmaceutics	Research Journal of Pharmacy and Technology	2021	0974-360X	1.203	https://www.rjptonline.org/	https://rjptonline.org/HTMLPaper.aspx?Journal=Research%20Journal%20of%20Pharmacy%20and%20Technology,PID=2021-14-2-73	SCOPUS, UGC approved
6	Natural Remedies used in the Treatment of Psoriasis: A short Review	Sondhi S, Singh N, Jindal S	Pharmaceutics	Asian Journal of Pharmaceutical Research	2021	2231-5691	0.46	https://asianjpr.com/Home.aspx	https://asianjpr.com/AbstractView.aspx?PID=2021-11-1-9	UGC care list
7	Potential of herbal treatment of Psoniasis: A Laconic Review	Sharma S, Sharma R, Goyal K, Jindal S	Pharmaceutical Chemistry	Asian Journal of Research in Pharmaceutical Sciences	2021	2231-5659	1.021	https://ajpsonline.com/	https://ajpsonline.com/AbstractView.aspx?PID=2021-11-1-9	UGC care list
8	Development of Topical Herbal Gel of Berberine Hydrochloride for the Treatment of Psoniasis	Sondhi S, Singh N, Goyal K, Jindal S	Pharmaceutics	Research Journal of Pharmaceutical Dosage Forms and Technology	2021	0975-4377	-	https://rjpdf.com/	https://rjpdf.com/AbstractView.aspx?PID=2021-13-1-3	UGC care list
9	Chalcones: A review on synthesis and pharmacological activities	Kamya Goyal, Rajwinder Kaur, Anju Goyal, Baiendra Awasthi	Pharmaceutical Chemistry	Journal of Applied Pharmaceutical Science	2021	2231-3354	0.761	https://www.japsonline.com/	https://japsonline.com/admin/php/uploads/3324.pdf.pdf	Scopus


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Topical creams of piperine loaded lipid nanocarriers for management of atopic dermatitis: development, characterization, and *in vivo* investigation using BALB/c mice model

Pravin Kumar ¹, Dinesh Kumar Sharma ², Mahendra Singh Ashawat ³

Affiliations + expand
PMID: 33944670 DOI: 10.1080/08982104.2021.1880436

Abstract

The aim of the research work was to investigate the efficacy of cream loaded with lipid nanocarriers (ethosomes) of piperine for the management of atopic dermatitis (AD) in comparison to conventional cream. Ethosomes of piperine were formulated with varying concentration of phosphatidylcholine and ethanol; and evaluated for entrapment efficiency (EE), sedimentation behaviour, vesicle size, zeta potential, *in vitro* drug release, and shape. Creams loaded with optimized ethosomal dispersion of piperine were formulated and evaluated for physicochemical parameters, *ex vivo* permeation and drug


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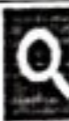

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Development of Phospholipids X

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Research Article

Development of Phospholipids Vesicular Nanocarrier for Topical Delivery of Tea Tree Oil in Management of Atopic Dermatitis Using BALB/c Mice Model

Pravin Kumar, Dinesh Kumar Sharma, Mahendra Singh Ashawat 

First published: 13 July 2021 | <https://doi.org/10.1002/ejlt.202100002> | Citations: 1

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Abstract

This work aims to develop and evaluate the efficacy of tea tree oil (TTO) ethosomal cream with improved deposition in skin layers for treatment of atopic dermatitis (AD). Ethosomes of TTO are developed using phosphatidylcholine (2% and 3% w/v) and ethanol (20%, 30%, and 40% w/v). Ethosomes are evaluated for percent entrapment efficiency.

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A REVIEW ON NANOSUSPENSION IN DRUG DELIVERY

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Abstract : Many of the newly developed drugs are poorly soluble and they create major problems during formulation and shows poor bioavailability. The problem is even more complex for drugs which belong to BCS Class II category. To overcome these problems nanotechnology is used to improve the solubility as well as bioavailability of poorly soluble drugs. Nanotechnology is defined as the science and engineering carried out in the nanoscale that is 10⁻⁹ meters. Nanosuspensions are a part of Nanotechnology. Nanosuspensions are defined as the submicron colloidal dispersions of pharmaceutical active ingredient particles in a liquid phase, size below 1 μ m, without any matrix material which are stabilized by surfactants and polymers. Nanosuspensions differ from nanoparticles and solid lipid nanoparticles with respect to the fact that nanoparticles are polymeric colloidal carriers of drug while solid lipid nanoparticles are lipid carrier of drugs. Preparation of nanosuspension is simple and applicable to all drugs which are water insoluble. Nanosuspensions are prepared by using wet mill, high pressure homogenizer, emulsion solvent evaporation, melt emulsification and supercritical fluid techniques. Nanosuspensions can be delivered by oral, parenteral, pulmonary and ocular routes. Nanosuspensions can also be used for targeted drug delivery when incorporated in the ocular inserts and mucoadhesive hydrogels. This review article mainly focuses on preparation of nanosuspensions by various techniques with their advantages and disadvantages, formulation considerations, Characterization and their applications in drug delivery. Nanosuspensions not only solves the problem of poor solubility

Keywords: Nanosuspension, stabilizer, co-surfactant, drug delivery

1. INTRODUCTION

Nanosuspensions of drugs are sub-micron colloidal dispersions of pure particles of drug, which are stabilized by surfactants. For the purpose of this review, they are distinguished from nanoparticles, which are polymeric colloidal carriers of drugs [9], and from solid lipid nanoparticles [24], which are lipidic carriers of drugs.

Activity in this area has exploded recently because of the need for solubility enhancement. This has become a problem during the past ten years because of the new paradigm in high-throughput screening of new drug candidates, which emphasizes the importance of good fit with target-receptor geometry. Candidates emerging from these screens have high molecular mass and high LOG P, both of which are factors that contribute to insolubility [17].

PREPARATION AND EVALUATION OF COPPER NANOPARTICLES LOADED HYDROGEL FOR BURNS

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ABSTRACT

Objective: The present study focuses on the development and optimization of copper nanoparticles (CNPs) loaded hydrogel for the treatment of dermal burn injuries.

Methods: CNPs gel was prepared by dispersing the variable concentration of polyvinylpyrrolidone (PVP K30) and hydroxypropyl methylcellulose (HPMC) in distilled water, PEG 400, and copper nanoparticles. Factor screening study was performed for identification of influential factors, followed by optimization study using three-factor Box-Behnken design.

Results: Optimized nanogel formulation, when compared to normal control (NC), shows a significant reduction of pro-inflammatory cytokines (IL-6 = 39.74 % and TNF- α = 49.37%) and increased level of anti-inflammatory cytokines (IL-10 = 30.90%), indicating reduced inflammation. Further, the wound closure rate of CNPs gel shows significant (12.27 %) wound closure as compared to the NC group and complete wound closure (100 %) on the 14th day, indicating accelerated wound healing.

Conclusion: the present investigation endorses accelerated scar-free, accelerated wound healing potential of copper nanoparticles gel with anti-inflammatory potential.

Keywords: Copper nanoparticles, Optimization, Hydrogel, Wound healing

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INTRODUCTION

A burn is an injury to organic tissue or skin primarily due to heat, chemicals, friction, electricity, or radioactivity. Thermal or heat burns occur when organic tissue or skin gets damaged due to exposure to heat [1]. The healing of burn injury involves three phases. The inflammatory phase is the initial phase which consists of vascular response consisting of extravasation of plasma fluids, which requires fluid replacement, followed by the cellular response in which neutrophils and monocytes migrate to the site of injury. Later the level of neutrophils decreases and is replaced by macrophages, followed by the release of chemotactic factors like kallikreins and fibrin by the coagulation process [2]. Mast cells release tumor necrosis factor, histamine, protease, leukotrienes, and cytokines. The cellular response promotes phagocytosis and removal of dead tissue to promote the generation of healthy tissues. Remodeling phase, in partial-thickness burns proliferation phases, starts by re-epithelization, in the form of keratinocyte migration from skin appendages with few hours of injury, which usually requires 5-7 d for complete wound coverage, followed by the formation of basement membrane zone between dermis and epidermis [3]. Angiogenesis and fibrogenesis promote the reconstruction of the dermis, followed by maturation of graft or scar. Initially, collagen and elastin deposit around the epithelial, endothelial, and smooth muscle in the form of an extracellular matrix. Finally, in the resolution phase. The extracellular matrix converts into myofibroblast phenotype, resulting in scar tissue contraction [4].

The current medical treatment for burn wound management includes immunization of the patient by tetanus prophylaxis, followed by the exercise of adherent dead tissue and necrotic tissue over the first several days. The cleaning of the burn wound is recommended by 0.25 % chlorhexidine, 0.1% cetrimide solution, or any other mild non-alcoholic based antiseptic

To obtain the best formulation for the development of hydrogel with desirable mean release time (MRT), viscosity, swelling index, along with accelerated wound healing, the relationship between a

controlled variable and quality variable must be understood. Traditionally we employ the method of "changing one variable at a time while keeping others at constant". By this approach, we need to screen each and individual combination of formulation, which proves laborious, expensive, and unfavorable for identifying and fixing unpredictable errors. In our approach, we employ the design of experiment (DOE) for obtaining crucial information for the understanding relationship between variables and response [5].

The objective of the study was the identification of formulation variables affecting characterization and wound healing property of hydrogel, using the response surface method (RSM). The objective of the study includes the optimization of polymer and copper nanoparticle concentration to obtain accelerated wound healing in burn wounds and optimize the factors that could affect the scaleup process or large-scale development [6]. The objective also includes a set guide for guidelines to eliminate the initial screening for the formulation and optimization of hydrogel from hydroxypropyl methylcellulose (HPMC) and Polyvinylpyrrolidone (PVP) for wound healing [7].

Copper nanoparticles were used as a model drug for the study. Responses such as mean release time, viscosity, wound healing days, and the swelling index was evaluated using Box-Behnken design (BBD).

MATERIALS AND METHODS

Materials

Copper nanoparticles were prepared in the previous publication [8], HPMC, PVP K30, and polyethylene glycol 400 (PEG-400) were purchased from a central drug house, New Delhi, India. All other chemicals were of analytical grade.

Preparation of hydrogel

The hydrogel was prepared by dispersing PVP K30 and HPMC into distilled water followed by continuous stirring for 1 h. and allowed



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Topical Methotrexate Cubosomes in Treatment of Rheumatoid Arthritis: Ex-Vivo and In-Vivo Studies

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ABSTRACT:

Late investigation of complex and shifted parts of rheumatoid joint pain (RA) is prompting the advancement of the more viable focuses for pharmaceutical methodology than it was previously. Current treatment for RA much of the time incorporates the utilization of non-steroidal anti-inflammatory drugs, notwithstanding the extreme antagonistic effects. Local application and consolidation of the medications in cubosomes based formulations may diminish those reactions and improve the efficacy of medications by decreasing the accessibility of them in systemic dissemination and expanding deposition and retention time at the inflamed sites. MTX cubosomes were formulated using Monoolein and Poloxamer-407 and water. The ex vivo skin saturation study was done with the assistance of rat abdominal skin using vertical Franz dispersion cell using PBS and samples were withdrawn and analyzed at defined intervals. In-vivo studies were performed on Female Wistar rats using Bovine type II collagen (CII; Chondrex, Redmond, WA, USA) arrangement in 0.1N acetic acid was emulsified with Freund's adjuvant and the emulsion was infused subcutaneously at the bottom of the tail. Ex vivo skin permeation using rat abdominal study, primary stage which was quick showed MTX penetration at the first 2h pursued by more slow medication infiltration during the following examined hours. Histopathological studies showed correlated results upon evaluation. Inflamed paw thickness was measured each and there was a considerable decrease in the paw size after the rats were treated with this novel delivery system.: The relative bioavailability of both the formulation was found to be 202.38% and 192.54% respectively, therefore the system was found to be more reliable and non-invasive for topical delivery.

KEYWORDS: Rheumatoid Arthritis, anti-inflammatory, Methotrexate, Topical, Cubosomes.

INTRODUCTION:

Rheumatoid joint pain (RA) is an immune system sickness that is principally showed by incessant erosive inflammation of the joints, related with extreme pain. Considerably after such huge numbers of progressions, its management is still a challenge in the treatment.^{1,2} It delivers a provocative reaction of the synovium (synovitis) of synovial cells and the advancement of pannus in the synovium. The pathology of the ailment once in a while prompts the obliteration of articular ligament and ankylosis of the joints (wrists, shoulders, knees, lower legs and feet).

Rheumatoid joint inflammation can likewise assault different pieces of the body similarly joints and even creates diffuse inflammation in the sclera, nodular injuries, lungs, pericardium, pleura, and furthermore in subcutaneous tissue. Accordingly, brings about an exhaustion despite the fact that individual may encounter any sensory changes or loss of senses.³

Methotrexate is an intense calming and immunosuppressant drug that diminishes cell expansion, expanding adenosine discharge, and restricting chemicals of folate digestion.⁴ MTX alters the localization of cell adhesion molecules, changes the composition of



REVIEW ARTICLE

Natural Remedies used in the Treatment of Psoriasis: A short Review

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ABSTRACT:

Psoriasis is an auto immune mediated inflammatory disease and autoimmune disease and no permanent cure. Psoriasis is non-contagious, dry and inflammatory skin disorder. The mechanism involves immune system to skin cell. Psoriasis are different parts induced on skin and characterized by sharply scaly, erythematous plaques. The psoriasis suffering any kind patients not depend on particular age and sex develop the disease. The causes are found genetic, environmental and immunologically. A variety of treatment available in market some are expensive and some are so much side effects. Ayurveda helps to diagnose psoriasis by natural plant. The treatment according to Ayurveda depends in their elements and Doshas. Herbal drug safe nature and easy availability as potential as anti-psoriatic activity. Psoriasis explore the proliferative activity. Herbal resources to develop a potent, safe and reliable therapy. Herbal creams, herbal gels and herbal lotions are mostly available and used in the treatment of psoriasis disease.

KEYWORDS: Psoriasis, Natural plants, Herbal remedies, treatment, Ayurveda.

INTRODUCTION:

Psoriasis is an autoimmune chronic disease in which environmental and genetic factors as an own significant role. The disease name derived from Greek word 'psora' means itch and 'isis' means inflammation. Psoriasis is non-contagious, dry and inflammatory skin disorder. It mainly characterized by sharply scaly, erythematous plaques and most commonly affected areas are scalp, fingers tips, toes, palms, elbows, under the breasts and genitals, knees. If one twin has psoriasis then possibility the other twin is three times more than affected. In this disease skin keeps scaling as flakes called as psoriatic plaques. Due to rapid and excessive growth of epidermis cells which looks fishy skin. During winter and certain medications such as beta blockers, NSAIDs, psychological stress can cause psoriasis. The mechanism involves immune system reacting to skin cell. Diagnosis based on the signs and symptoms.

The silvery white plaques are caused by accelerated regeneration and accumulation of skin sites. Due to rapid destruction process. Plaques psoriasis frequently appears on skin of elbows and knees size range may few millimeters to a large part of limb or trunk. Psoriasis can cause inflammation of joints which known as psoriatic arthritis. Psoriasis linked to dandruff and arthritis as well as linked to HIV virus^[1,2].

Ayurveda:

Ayurveda is Sanskrit derive from two words Ayur and Veda. The word 'Ayus' means Life and the word 'Veda' means knowledge or science. Hence the whole Ayurveda word says that knowledge of life^[7].

Treatment:

The Ayurveda follows five great natural elements Prithvi (earth), Jal (water), Agni (fire), Vayu (air) and Akash (sky). According to these natural elements immune system working naturally must be harmony with fault, tissue and impurity. Ayurveda deals with three energies element (Doshas), Vatt (energy of movement), Pitta (energy of digestion and metabolism) and Kapha (energy of lubrication). These doshas or elements depends Vatt (Air + Space=Wind), Pitta (Fire + Water = Bile), Kapha (Water + Earth = Phlegm)^[7].

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REVIEW ARTICLE

Potential of herbal treatment of Psoriasis: A Laconic Review

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ABSTRACT:

Psoriasis is an inflammatory, auto immune disorder of the skin affecting 2 to 3% of people globally. It mainly affects all of the body parts especially hands, foot and limbs. In psoriasis, body starts to make new skin cells more rapidly than normal leads to the development of raised skin patches and tissues on the skin. Various kinds of treatment options are available for the treatment of psoriasis but they all are associated with various kinds of side effects. There is research gap between the use of various herbs and crude drugs used in the treatment of psoriasis with various dosage forms. Till now reviews are not available with treatment of psoriasis with herbal formulation. In this review, our objective is to cover the treatment options available for the treatment of psoriasis with the potential of herbs used for the psoriasis. In this review, we summarized a list of herbal plants which are known to have potential antipsoriatic activity and can be used for the treatment of psoriasis. But, most of the available literature of herbals are lacking clinical outcome of efficacy of herbals in treating the psoriasis. In the last, we can say that herbs from various natural origin can be used in the treatment of psoriasis as compared to synthetic drugs. This review will help or motivate the researcher for the evaluation of antipsoriatic potential of these herbs with all the safety features and help them to use this information for the development of herbal dosage forms that can effectively used for the management and treatment of psoriasis.

KEYWORDS: Herbal Plants, Psoriasis, Treatment, *Aloe vera*, Herbal formulations, Psoriatic arthritis.

INTRODUCTION:

Psoriasis is a hyper proliferative, immune system skin issue influencing 1-3% of the total population. Somewhere in the range of 1.5% and 3% of individuals on the planet have psoriasis. Our skin is comprised of a large number of small skin cells.¹⁻³ Normally, skin cells kick the bucket and are supplanted by new ones in every three months.⁴ In psoriasis, body starts to make new skin cells more rapidly than normal leads to development of raised skin patches and tissues on the skin.⁵⁻⁷ This is identified by body and showed various immune response, leads to the autoimmune disorder.⁸⁻¹⁰

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RESEARCH ARTICLE

Development of Topical Herbal Gel of Berberine Hydrochloride for the Treatment of Psoriasis

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²Department of Pharmaceutical Chemistry and Analysis, Laureate Institute of Pharmacy, Kathog, Jawalamukhi, Himachal Pradesh 176031, India

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ABSTRACT:

Psoriasis is a most common long lasting chronic autoimmune inflammatory skin disease. Psoriasis is affecting approximately 2% - 3% of world population. The possibility to develop psoriasis by causing emotional stress, infections, intestinal abnormal and specific medications. The present paper aimed to investigate the effect of permeation enhancer on permeation of hydrogels prepared with Berberine hydrochloride. The Berberine hydrochloride is herbal phytoconstituents which obtained from the plant of *Tinospora cordifolia*. The hydrogels was prepared by using Carbopol 934. The prepared hydrogel was evaluated for physical appearance, drug content, pH, viscosity, spreadability, homogeneity, grittiness and *in-vitro* release. The effect of permeation enhancers was examined to enhance the drug release profile up to 8hours, when compared with or without permeation enhancers. The mechanism of drug release was found to be non-Fickian. From the results it was concluded that permeation of Berberine hydrochloride hydrogel was enhance release by using transcutool P in two concentration (0.1% and 0.2%).

KEYWORDS: Psoriasis, Berberine hydrochloride, Hydrogel, Transcutol P and Drug release.

INTRODUCTION:

Psoriasis is a most common long lasting chronic autoimmune inflammatory skin disease. Psoriasis is affecting approximately 2% to 3% of world population. The word psoriasis is derived from Greek word "Psora" means itch and "iasis" means condition.

It characterized papules or erythematous plaques and skin lesions covered with silvery scales. The most commonly skin affected areas elbows, knees, breasts, scalp, hand, feet, palms, fingers and toes to treatment of complete body. In case, darker skin the patches may be purple in color.^(1,2)

The symptoms observed psoriasis skin patches are irritation, dryness, pain, redness and itching on skin. For detailed studied psoriasis, it categorized in different psoriasis such as invasive psoriasis, plaque psoriasis, psoriatic arthritis, nail psoriasis, scalp psoriasis and several types psoriasis. According to IFPA (International

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Chalcones: A review on synthesis and pharmacological activities

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Key words:

Chalcone, Claisen-Schmidt condensation, anticancer, antimicrobial, antidiabetic.

ABSTRACT

Chalcone is a privileged species with medicinal significance as it consists of reactive ketoethylenic moiety $-CO-CH=CH-$ belonging to flavonoids. The presence of a reactive α, β -unsaturated carbonyl function in chalcone and its derivatives is the reason for its pharmacological activities. Chalcones exhibit a wide spectrum of pharmacological effects such as antioxidant, antibacterial, anthelmintic, antiulcer, antiviral, insecticidal, antiprotozoal, anticancer, anti-inflammatory, antidiabetic, etc. Chalcones can be synthesized by Claisen-Schmidt's condensation, Heck's reaction, Suzuki's reaction, etc. The purpose of this review is to focus on the methods of synthesis of chalcones and their versatile pharmacological activities.

INTRODUCTION

The chemistry of chalcone PGs is gaining intense research interest globally. The term "Chalcone" was coined by Kostanecki and Tambor (1899). Other names for chalcones are benzyl acetophenone or benzylideneacetophenone. In the structure of a chalcone, two benzenoid rings are joined by an aliphatic chain of three carbons. Chalcone is an α, β -unsaturated ketonic compound consisting of two benzenoid rings with wide variety of groups. Aromatic groups are connected to each other by three carbons, α, β -unsaturated ketonic system, highly electrophilic in nature having a linear structure (Awasthi *et al.*, 2009; Cheng *et al.*, 2000; Liu *et al.*, 2001). They have ketoethylenic moiety ($-CO-CH=CH-$) in their structure. They have a conjugated double bond and an entirely delocalized π -electron-containing order on aromatic rings. Chalcones have been utilized as a precursor for the synthesis of compounds which possess pharmacological importance (Straub, 1995). The chalcones' chemistry remains a major interest for scientists in the 21st century, producing a diversity of promising pharmacological activities like anti-inflammatory (Dhar *et al.*,

2018; Fu *et al.*, 2019; Gan *et al.*, 2018; Li *et al.*, 2017; Mahapatra *et al.*, 2017; Md Idris *et al.*, 2018; Sayed *et al.*, 2018), analgesic (Fu *et al.*, 2019), antigout as xanthine oxidase inhibitors (Hofmann *et al.*, 2016), antihistaminic (Padaratz *et al.*, 2009; Rossi and Avellino, 1957), anticancer (Gan *et al.*, 2018; Hsieh *et al.*, 2019; Khanapure *et al.*, 2018; Özdemir *et al.*, 2017; Pingaew *et al.*, 2014; Sashidhara *et al.*, 2010), antileishmanial (Insuasty *et al.*, 2015), antimalarial (Pingaew *et al.*, 2014), antiviral (Wan *et al.*, 2015), antiulcer (Choudhary *et al.*, 2012), antimicrobial (Benouda *et al.*, 2019; Lal *et al.*, 2018; Monga *et al.*, 2014; Özdemir *et al.*, 2017; Sayed *et al.*, 2018), antioxidant (Bandgar *et al.*, 2010), antidiabetic (Balu *et al.*, 2019; Emayavaramban *et al.*, 2013; Gaur *et al.*, 2014; Hsieh *et al.*, 2012; Rammohan *et al.*, 2020; Shukla *et al.*, 2017), etc. Metochalcones increase bile secretion by stimulating the liver (Sahu *et al.*, 2012) and sofalcone as an antiulcer agent, which increases the concentration of Prostaglandins from the mucosa causing a gastroprotection from *Helicobacter pylori*-induced ulcers (Higuchi *et al.*, 2010). It is also found through clinical trials that hesperidin methylchalcone was tested and found effective for chronic peripheral venous lymphatic insufficiency (Beltramino *et al.*, 1999, 2000) and hesperidin trimethylchalcone was found effective for trunk or branch varicosis (Weindorf and Schultz-Ehrenburg, 1987).

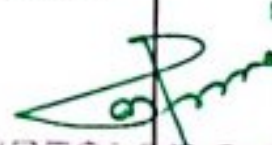
Abstract of this article was presented at CUDC consortium and Summer School Conference at Chitkara University.

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List of Publication in 2020

S. No	Title of Paper	Name of the authors	Department of teacher	Name of Journal	Year of Publication	ISSN number	Impact Factor	Link to website of journal	Link to article/paper/abstract of the article	Is it listed in UGC care list/Scopus/ Web of Science/other, mention
1	Development of Mucoadhesive Buccal Drug Delivery System of Propranolol Hydrochloride Using <i>Aster ericoides Mucilage</i>	Ankaj Kaundal, Pravin Kumar, Rajendra Awasthi, G. T. Kulkarni	Pravin Kumar	Drug Delivery Letters	2020	2210-304X	Nil	https://benthamscience.com/journals/drug-delivery-letters/	DOI: 10.2174/2210303109666191010164201	Scopus
2	Pathophysiology and management of atopic dermatitis: A Laconic review	Pravin Kumar, Dinesh Kumar Sharma, Mahendra Singh Ashawat	Pharmaceutics	Current drug therapy	2020	2212-3903	Nil	https://benthamscience.com/journals/current-drug-therapy/	eurekaselect.com/article/100497	Scopus, SCIE
3	Traditional Herbal Medicines, Newer Herbs and Other Novel Approaches Integrated in Herbal Medicine for Atopic Dermatitis-A Narrative Review	Pravin Kumar, Dinesh Kumar Sharma, Mahendra Singh Ashawat	Pharmaceutics	Current drug therapy	2020	2212-3903	Nil	https://benthamscience.com/journals/current-drug-therapy/	https://www.eurekaselect.com/article/101632	Scopus, SCIE
6	Therapeutic evaluation of chemically synthesized copper nanoparticles to promote full-thickness excisional wound healing	ASHISH KUMAR, VINAY PANDIT, UPENDRA NAGAICH	Pharmaceutics	International Journal of Applied Pharmaceutics	2020	0975-7058	0.82	https://innovareacademics.in/journals/index.php/ijap	https://innovareacademics.in/journals/index.php/ijap/article/view/38869	SCOPUS, UGC APPROVED
7	Development of Solid Dispersions of Clopidogrel using Innate Excipient: Synergistic Antiplatelet Activity	Chander Pal Singh Verma1, Santosh Verma2, Mahendra Singh Ashawat3, Vinay Pandit	Pharmaceutics	Indian Journal of Pharmaceutical Education and Research	2020	00195464	0.638	https://www.ijper.org/	https://www.ijper.org/sites/default/files/IndJPhaEdRes_54_4_1007.pdf	Scopus, UGC approved
8	Possible potential treatment strategies against novel coronavirus sars-cov-2	U Thakur, A Kumar, R Rana, MS Ashawat	Pharmacognosy	International Journal of Pharmaceutical Research	2020	0975-2366	0.67	http://www.ijproonline.com/	https://www.kbrconline.com/wp-content/uploads/2020/10/1990-1999-IJPRSP12020221.pdf	UGC, EBSCO, Elsevier Embase
9	Simultaneous estimation of Halobetasol propionate and Tazarotene in pure and dosage form by using UV-Visible Spectrophotometric method	Kumar A, Goyal K, Pandit V, Ashawat MS, Jindal S	Pharmaceutics	Research Journal of Pharmacy and Technology	2020	0974-360X	1.203	https://www.rjptonline.org/	https://www.rjptonline.org/AbstractView.aspx?PID=2020-13-10-32	Scopus
10	Topical delivery of Tacrolimus using liposome containing gel: An emerging and synergistic approach in management of psoriasis	Jindal S, Awasthi R, Singhare D, Kulkarni GT	Pharmaceutics	Medical Hypotheses	2020	0306-9877	1.538	https://www.journals.elsevier.com/medical-hypotheses	https://www.sciencedirect.com/science/article/abs/pii/S030698772030565X	Scopus, Web of Science
11	A Review on Antimalarial 1, 2, 4-Trioxane Derivatives	Choudhary A, Sinha M, Devi A, Jindal S, Goyal K	Pharmaceutical Chemistry	Journal of Drug Delivery and Therapeutics	2020	2250-1177	0.675	https://jddtonline.info/index.php/jddt	http://jddtonline.info/index.php/jddt/article/view/4268	UGC care list
12	A Laconic Review on Extraction, Biological Activities of Herbal Formulations of Berberine: A Traditional Drug	Sondhi S, Singh N, Goyal K, Jindal S	Pharmaceutics	Journal of Drug Delivery and Therapeutics	2020	2250-1177	0.675	https://jddtonline.info/index.php/jddt	http://www.jddtonline.info/index.php/jddt/article/view/4300	UGC care list
13	Development and Characterization of Barbaloin Gel for the Safe and Effective Treatment of Psoriasis	Singh N, Goyal K, Sondhi S, Jindal S	Pharmaceutics	Journal of Drug Delivery and Therapeutics	2020	2250-1177	0.675	http://jddtonline.info/index.php/jddt	http://jddtonline.info/index.php/jddt/article/view/4299	UGC care list
14	Treatment and Management for patients with mild to severe Psoriasis: A Review	Singh N, Sondhi S, Jindal S, Pandit V, Ashawat MS	Pharmaceutics	Asian Journal of Pharmaceutical Research	2020	2231-5691	0.46	https://asianjpr.com/	https://asianjpr.com/AbstractView.aspx?PID=2020-10-4-7	UGC care list


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Drug Delivery Letters

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Research Article

Development of Mucoadhesive Buccal Drug Delivery System of Propranolol Hydrochloride Using *Aster ericoides* Mucilage

Author(s): Ankaj Kaundal, Pravin Kumar, Rajendra Awasthi and Giriraj T. Kulkarni

Volume 10, Issue 2, 2020

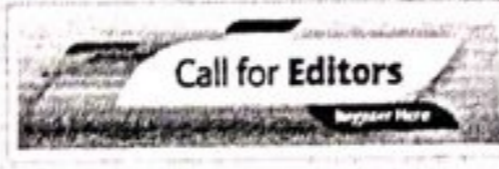
Page: [133 - 148]

Pages: 16

DOI: 10.2174/2210303109666191010164201

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Abstract

Aims: The study was aimed to develop mucoadhesive buccal tablets using *Aster ericoides* leaves mucilage.

Background: Mucilages are naturally occurring high-molecular-weight polyuronides, which have been extensively studied for their application in different pharmaceutical dosage forms.

Article Metrics



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13



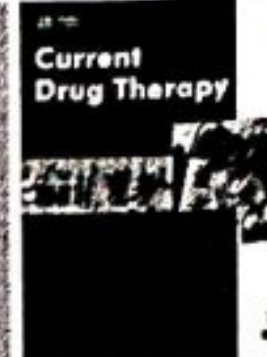
HTML

2

REVIEW ARTICLE



Pathophysiology and Management of Atopic Dermatitis: A Laconic Review



Pravin Kumar^{1,*}, Dinesh Kumar Sharma² and Mahendra Singh Ashawat¹

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Abstract: Atopic Dermatitis (AD) is long-lasting degenerating skin disease with a characteristic phenotype and stereotypically spread skin lesions. The AD results due to a complex interface among genetic factors, host's surroundings, pharmacological anomalies and immunological factors. In previous decades, researchers had shown marked interest due to increased prevalence in developed countries. In this review, basics along with the advances in pathogenesis and management of AD have been discussed. The immunological factors *i.e.* Innate Lymphoid Cells, IL-22 and Toll-like receptors have an important role in the pathogenesis. The proactive topical therapy by skincare, topical glucocorticosteroids and calcineurin inhibitors have improved effect in the management of AD. The human monoclonal antibody-based systemic drug (Duplimab) is a considerable advancement in the management of AD. Other monoclonal antibody-based drugs (Lebrikizumab, Tralokinumab, Apremilast and Nemolizumab) are in different phases of clinical trials. A better understanding of genetics and immunoregulatory cascade will lead to the development of efficacious drugs and better management therapy preventing the relapse of flares and improved life quality of AD patients.

Keywords: Atopic dermatitis, eczema, glucocorticosteroids, skin, duplimab, tacrolimus.

1. INTRODUCTION

The word Atopic Dermatitis (AD) was first coined by Wise and Sulzberger to explain 'puzzling type of local or general lichenification of skin [1]. AD is an extremely pruritic inflammatory skin condition mostly seen in early childhood but can also continue or start in adulthood [2]. It is a long-lasting reverting skin disease with a distinguishing phenotype and characteristically spread skin lesions [3]. Atopy can be explained as a familial or personal propensity to generate IgE antibodies and sensitization in response to environmental stimulators. Mainly, two forms of AD have been identified, the extrinsic form linked with IgE intermediated sensitization and intrinsic form without IgE intermediated sensitization [3, 4]. The extrinsic form is more prevalent than the intrinsic form. In the past few years, considerable interest has been generated for AD due to the increased prevalence in the western world, effect on the health care cost and quality of life [5]. The sparked interest has led to better understanding of complicated pathophysiological and genetic causes responsible for the manifestation of the AD. Here, basics along with the signs of progress in understanding of epidemiology, genetics, pathophysiology and management of AD in last decades have been discussed.

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2. EPIDEMIOLOGY

The lifetime incidence of AD in teenagers is 10-20% and in adults is 1-3%. AD has more prevailed in the developed countries in comparison to the developing countries [2]. In the developed countries also, its prevalence is higher in the urban area as compared to the rural or agricultural area. The disease has been reported to be more prevalent in high economic society. Lifestyle and environment have a significant role in the prevalence of the disease [2]. Numbers of hypothesis have been put forward to explain the development of AD in infants. One of the favored hypotheses is the more expression of Th2 cytokine profile in human fetal lymphocytes due to the intrauterine priming by placental cytokines and hormones and possibly by transplacental allergen exposure [6, 7]. Research finding suggests that the major supporting factors for AD are increased income, small family size, education, relocation from rural to urban area and more use of antibiotics [8]. In a very recent review, Chan *et al.* established a positive correlation between experience of stress by mother and risk of AD to the fetus or newborn child [9].

3. CLINICAL DIAGNOSTIC FEATURES AND SEVERITY OF AD

Atopic dermatitis shows a varied range of clinical skin features. Some of the features are the essential features present with almost all the cases of AD; while some are the minor features often associated with the major features (Table 1)



Current Drug Therapy

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Review Article

Traditional Herbal Medicines, Newer Herbs and Other Novel Approaches Integrated in Herbal Medicine for Atopic Dermatitis-A Narrative Review

Author(s): Pravin Kumar, Dinesh Kumar Sharma and Mahendra Singh Ashawat

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Pages: 15

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Abstract

Atopic Dermatitis (AD) is a prolonged reverting skin ailment with characteristically distributed skin lesions. In the previous decades, researchers had shown a marked interest in AD due to its increased prevalence in

Article Metrics

PDF	HTML	ePUB	PRC
16	2	1	1

2 Total citations
2 Recent citations

REVIEW ARTICLE

Nipah Virus and its Outbreaks in Tropical Areas

Shiv Kumar Kushawaha¹, Neelam Raj¹, Mahendra Singh Ashawat¹, Manish Sinha^{1*},
Puneet Kumar².

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ABSTRACT:

Nipah virus is an emerging zoonosis with the potential to cause significant morbidity and mortality in humans. This virus escaped obscurity as a nameless animal virus and assured a place for itself in the annals of history as most fatal virus by killing a large number of people and bringing down billion dollar swine industry in Malaysia within short span of time. Nipah virus is an enveloped negative-strand RNA paramyxovirus. The natural reservoir for this virus is 'flying fox' fruit bats. The virus caused an outbreak of severe febrile encephalitis in humans with a high mortality rate. Nipah virus provides one of the most striking examples of an emerging virus and illustrates many of the pathways leading from a wildlife reservoir to human infections. This review will provide the background of the emergence of Nipah virus, symptoms, pathogenesis & pathology, prevention, control, and treatment.

KEYWORDS: Nipah, Zoonosis, Flying Fox', Encephalitis, Mortality Rate.

INTRODUCTION:

Nipah is a viral zoonotic disease of wide occurrence. The name Nipah virus was proposed because the first isolate was made from clinical material from a fatal human case from Kampung Sungai Nipah, a village in Negeri Sembilan.^[1] Today, the mortality rate of Nipah lies in between 40% to 100% for both humans and animals. Thus, NiV is one of the most deadly virus known to infect the humans and animal.^[2,3] The large percentage of casualty occurs in the tropical regions especially Asia, including the Indian subcontinent, Australia, Indonesia, Madagascar, and a number of remote oceanic islands in both the Indian and Pacific oceans where the absolute burden of these diseases is up to 130 times greater than in developed countries. Despite numerous control measures, it continues to be uninterrupted with high morbidity and mortality in these areas.^[4] 20 years of nipah infection and the death ratio has been summarized in figure 1. Recently, this fatal virus emerged in India.

India has a fast-growing human population which causing increased animal-human interactions, combined with changing environmental conditions and inadequate sanitation have made India one of the world's top hotspots for livestock diseases. Due to loss of habitat and food availability, bats have driven toward human-populated areas. Similarly, encroachment by farmers into bat habitats creates exposure to these emerging pathogens. Bats have been recognized to be an important reservoir of zoonotic viruses, including Ebola, Marburg, SARS and Melaka viruses.^[5,6,7,8,9]

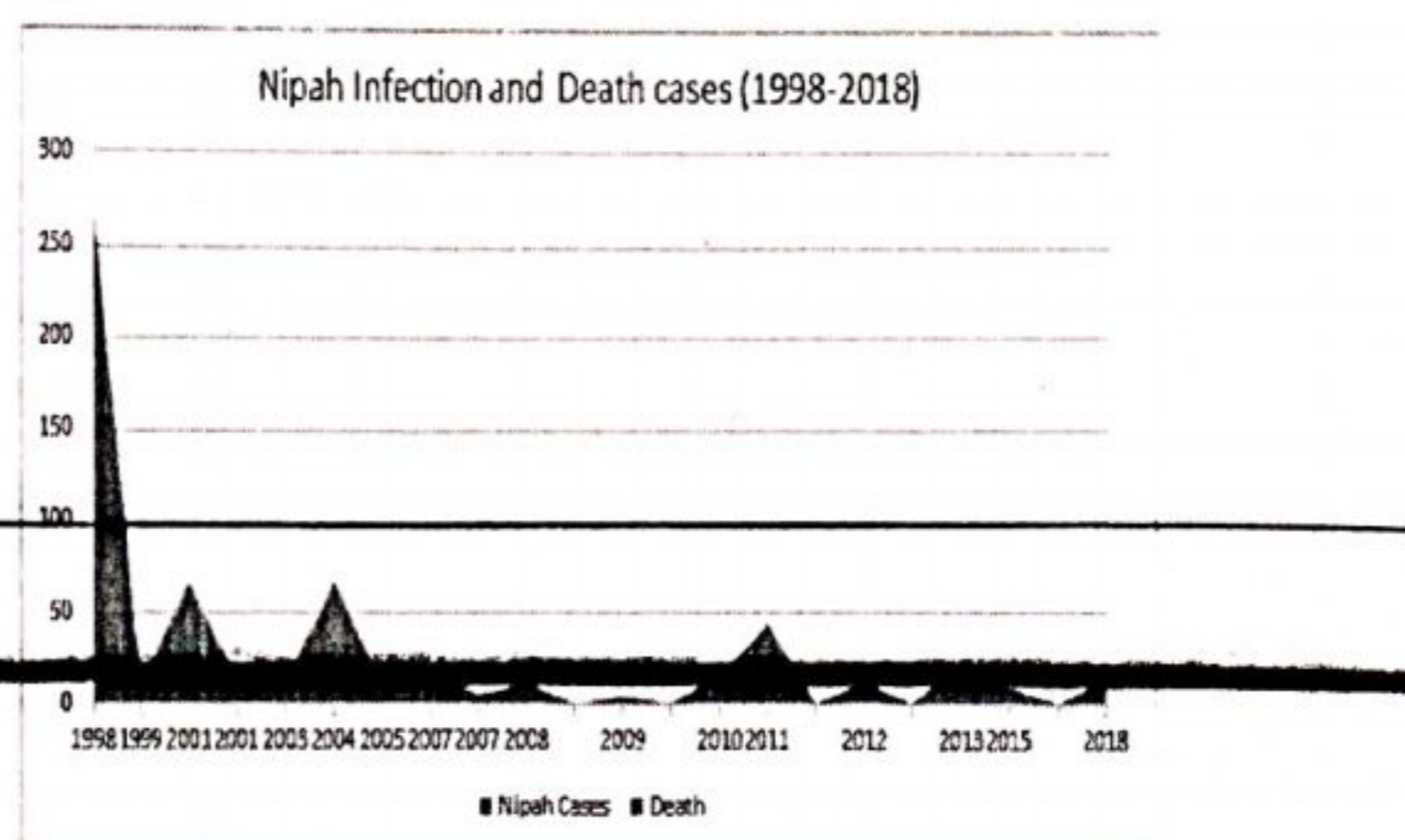


Figure 1: 20 Years of Nipah Virus and Human Interactions

DEVELOPMENT AND CHARACTERIZATION OF SUSTAINED RELEASE METHOTREXATE LOADED CUBOSOMES FOR TOPICAL DELIVERY IN RHEUMATOID ARTHRITIS

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ABSTRACT

Objective: Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) are essential part of the administration of Rheumatoid Arthritis (RA). Methotrexate (MTX) is effective for tumor necrosis factor alpha (TNF- α) biologic agents, indicated only in minority of patients suffering from severe RA. MTX remains the "anchor drug" in the treatment of RA. For delivery improvement, novel pharmaceutical drug delivery system i.e. MTX-Cubosomes were developed.

Methods: Poloxamer 407 and Glycerol monooleate (Monoelin, MO) used and the formulation were characterized as a sustained release drug delivery system for Methotrexate. Different ratios of Monoelin, Poloxamer 407 and water were used to develop the different cubosomes using homogenization and emulsification method. Characterization of formulations for morphology was performed and also particle size distribution by Transmission Electron Microscopy (TEM).

Results: Formulation showed the internal cubic structures of the vesicles. The particle size of the formulations was found to be ranging from 53.21 to 185.32 nm, zeta potential of the formulations varied from -18.20 to -36.10 mV. The cubosomal formulation exhibited good entrapment efficiency along with high drug loading. Compatibility with the excipients was also established. An in vitro release study was done using Franz Diffusion cell indicated sustained release of the formulation at a rate of 1.25 %/h. Cubosomes proved to be reliable system for sustained transdermal drug delivery system.

Conclusion: Methotrexate cubosomes is a novel medication delivery framework and in this examination it has been developed and characterized. The formulations were found to be promising in terms of its characterization parameters like particle size, zeta potential, entrapment efficiency, loading capacity, release kinetics, and stability, suitable for topical delivery.

Keywords: Rheumatoid arthritis, NSAIDs, Cubosomes, Methotrexate

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INTRODUCTION

RA is an autoimmune system sickness related with cutting edge incapacity, foundational inconveniences, early passing, and financial costs [1]. RA is an affliction depicted by methods for intense and constant fundamental disease that incorporates the joints, and affects tissues and organs that comprise of veins, heart, skin, lungs, and muscles. The beginning and seriousness of infection are alterable and tricky. RA at first bears with weakness, musculoskeletal agony, and firmness and after certain weeks to months it develops to include joints. The little joints are influenced first, the little bones of the fingers than the bigger joints are influenced, winds up swollen, warm, and painful [2]. Morning firmness or stiffness is additionally the signs and manifestations of RA and proposes enthusiastic illness. The influenced individual for the most part characterizes gradualness or challenge in development [3].

It creates a fiery reaction of the synovium (synovitis) of synovial cells and the pannus improvement in the synovium. The pathology of the confusion once in a while prompts the decimation of articular ligament and ankylosis of the joints (wrists, shoulders, knees, lower legs and feet). RA can likewise affect different segments of the body in like manner joints and even delivers diffuse disease or irritation in the lungs, pericardium, pleura, and sclera, nodular sores, and in subcutaneous tissue. It is viewed as a systemic autoimmune system disease [4].

MTX is a robust anti-inflammatory and immunosuppressant drug that diminishes cell expansion, expanding adenosine discharge, and hinders catalysts of folate metabolism [21]. MTX adjusts the expression of cellular adhesion molecules, changes the generation of cytokines, and results on humoral reactions, and bone arrangement and affidavit [17] MTX is considered BCS class IV (Biopharmaceutics Classification System) medicate (hydrophobic medication with a low penetrability) [18] and is trying to manage because of the reality of instability and mild sensitivity [19]. The awful pharmacokinetics and assurance issues of the MTX limit its therapeutic impacts. The dangerous results on oral and gastrointestinal mucosa incorporate,

stomatitis and seeping of the mucous films of the mouth or in gastrointestinal (GI) tract, ulcerations, enteritis and stomach trouble by method for conventional medication transport routes [29]. Oral absorption likewise is very low [3-6] and because of its concise complete half-life, [12] the transdermal use of MTX is by all accounts increasingly invaluable to accomplish good aid from pain.

Cubosomes, cubic portion is an intriguing method for medication transport comprising of a bent relentless lipid bilayer reaching out in three dimensions and keeping separated two consistent systems of water channels [13-16]. It can encase hydrophilic, amphiphilic, and hydrophobic components going from little small-molecular-weight drugs to proteins, peptides, amino acids, and nucleic acids [16]. Bi-phasic cubic stages are available in regular lipids, cationic [24] and nonionic surfactants, [25] and polymer framework, The primary pioneer of cubosome development is monoelin which is a blend of the oleic glycerides and other unsaturated fats comprises of the monooleate [26-28]. Cubic phase of cubosomes [29] as a result of its little pore size (5-10 nm) has an application for controlled release; and furthermore can solubilize hydrophobic, hydrophilic, and amphiphilic molecules; and has biodegradable activity [30]. It is emphatically bioadhesive [31] with great compatibility with topical and mucosal deposition and conveys dynamic fixings due to its skin penetration enhancing capability [32].

Hence, the objective behind this study was to formulate topical cubosomes, novel delivery system that could help in Rheumatoid Arthritis improving absorption to the skin and simultaneously reduce the systemic diffusion of the skin-absorbed drug.

MATERIALS AND METHODS

Materials

Methotrexate was a kind gift from IPC, India. Poloxamer 407, MO was obtained from Gattefose, France. Dialysis membrane (molecular

THERAPEUTIC EVALUATION OF CHEMICALLY SYNTHESIZED COPPER NANOPARTICLES TO PROMOTE FULL-THICKNESS EXCISIONAL WOUND HEALING

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ABSTRACT

Objective: The purpose of this research was, synthesis of copper nanoparticles using environment friendly cementation method and evaluate their wound healing property on full-thickness excisional wound.

Methods: Present study reports the synthesis of CNPs by single-step cementation method. Evaluation of CNPs was endorsed by morphological and chemical properties. Furthermore, CNPs was evaluated for its antibacterial potential and invitro hemocompatibility. Additionally, pharmacological evaluation of CNPs was assessed against excisional wound.

Results: Characterization of final product indicate, particle size of CNPs were ranging from 100-150 nm. CNPs showed significant antibacterial activity (A= 2.1±0.1 mm, B =2.1±0.1 mm, C = 1.9±0.2 mm, at 10µg/ml), along with superior hemocompatibility (RBC cell survival 97±1 %). Further CNPs formulation shows increased level of anti-inflammatory cytokinin's (IL-10, 42.7%) as compared to standard (STD), vehicle control, and normal control groups, attributed to accelerated wound healing (p<0.05 vs STD).

Conclusion: The consequences the present investigation endorse the accelerated wound healing potential of CNPs with its anti-inflammatory potential.

Keywords: Copper nanoparticle, Biocompatibility, Antibacterial potential, Wound healing

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INTRODUCTION

Wound healing is a complex biological progression; wounding leads to tissue inflammation and the release of several pro-inflammatory cytokines including interferon-gamma (IFN-γ), interleukin [1] (IL-1), and tumor necrosis factors (TNF). The release of pro-inflammatory cytokines consequently recruits monocytes and macrophages [2]. Moreover, IFN-γ, TNF-α, and IL-1β lead to tissue apoptosis, because of the triggering of the innate immunity [3]. Wound healing requires a balance of micro-elements, matrix metalloproteinases, antioxidants, and other factors. Thus, over activation of pro-inflammatory cytokines and obstructed instigation of anti-inflammatory mediates delayed the healing rate of the wound [4].

Inhibition of the production of inflammatory cytokines, inflammatory transduction cascades, reduction of oxidative factors, and prevention of the microbial growth at the wound site may delay the healing rate [5]. Copper has an important role in the synthesis and stabilization of various skin proteins [6]. In addition, copper has been used against both gram-positive and gram-negative bacteria, fungi and vira [7]. Copper is traditionally known for its exceptional antibacterial and anti-inflammatory properties [8]. Moreover, copper enhances the rate of wound healing by providing optimum antibacterial and anti-inflammatory properties [9].

There is increase in the resistance to antibiotics and minimal anti-inflammatory activity, limits the wound healing property of currently available agents [10]. Copper may be a promising therapeutic agent, as it has significant antibacterial, anti-inflammatory, and wound healing potential [11]. However, copper deficiency is the common factor for impaired wound healing; copper nanoparticles (CNPs) having a particle size less than 33.8±0.3 nm have shown significant toxicity when compared to a nanoformulation of particle size 103±0.3 nm [12].

MATERIALS AND METHODS

Materials

Copper nitrate was purchased from Central Drug House, New Delhi, India. Iron powder was purchased from Central Drug House, New

Delhi, India. All other chemicals were of analytical grade, microbial culture *escherichia coli* (MTCC No. 1687), *kocuria rhizophila* (MTCC No. 1541) and *staphylococcus aureus* (MTCC No. 737) were obtained from CSIR-Microbial type culture collection and gene bank, Chandigarh, India. Formulation of 30 µg/ml of CNPs was suspended in 2% of Polyvinylpyrrolidone (PVP) solution and applied to wound exposed areas as treatment.

Instrumentation

Surface plasmon resonance was monitored using a UV-Visible spectrophotometer, Perkin Elmer LAMBDA 950 UV/Vis, operated between 800 to 200 nm wavelength ranges at room temperature. Copper ion concentration in the mother solution was determined by Atomic absorption spectroscopy, Perkin Elmer AA Spectrometers, Analyst 400. Fourier-transform infrared spectroscopy of the mother solution and nanoparticles was observed using the ALPHA II FTIR Spectrophotometer Bruker, USA. Hydrodynamic and stability of nanoparticles were determined by, Nanobook 90 plus, Brookhaven, USA and Malvern v2.3 Zeta potential analyser, USA. Morphological parameters were evaluated using, Scanning Electron Microscope, Zeiss Evo HD, Jena, Germany, and Transmission Electron Microscope, Morgagni 268D Fei Electron Optics, USA. Elemental analysis was done using EDS Oxford Instruments, UK. Morphology of the biological samples was done using an inverted microscope, Cosmo laboratory equipment, Ambala, India. The absorbance of immunological samples was evaluated using Erba Lisa Scan EM, Transasia Bio-Medicals Ltd. India.

Preparation of copper nanoparticles

CNPs were prepared using a cementation process. An iron plate having a surface area of 1 cm² is placed in a freshly prepared solution of copper nitrate at 70 °C for 120 min. Freshly prepared nanoparticles were centrifuged at 11700 Relative Centrifugal Force (RCF) for 15 min. The supernatant was discarded, and the nanoparticles were resuspended in fresh distilled water by sonification. This process was repeated until a clear supernatant solution was obtained. Finally, 2% PVP was added to freshly prepared nanoparticles suspension to prevent the formation of larger size nanoparticles by agglomeration of nanoparticles.

Development of Solid Dispersions of Clopidogrel using Innate Excipient: Synergistic Antiplatelet Activity

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ABSTRACT

Aim: The present study encompasses on formulation and evaluation of solid dispersion of Clopidogrel, Class II drug-using pectin extracted from mango peel. **Materials and Methods:** Pectin was extracted from full-grown mango peel grown in the Kangra region. Solid dispersions were prepared using kneading, hot fusion method and solvent wetting method and the solvent wetting method were gauged and optimized. The prepared solid dispersions were subjected to solubility analysis and selected optimized formulation was further subjected to DSC, PXRD, *in-vitro* Dissolution and *in-vitro* antiplatelet activity. The *in-vitro* release studies are subjected to mathematical data analysis using DD Solver 1.0 version. **Results:** Extracted pectin from mango peel was light brown in color and soluble in water. The screened carriers PVPK30 and extracted pectin showed the enhanced solubility of pure drug. The pectin was further selected for the formulation of solid dispersions by three different methods. The solvent wetting method has given expected results and the formulation SD6 containing drug: pectin ratio 1:2 was selected and evaluated. The *in-vitro* release has shown 91.2 % in 60 min with a mean dissolution time of 14.64 min and dissolution efficiency of 0.691%. The formulation SD6 has shown 87.1 ± 1.8 % antiplatelet activities whereas pure drug has shown 71.9 ± 2.1 % indicating enhanced activity. **Conclusion:** It was concluded that the pectin extracted from ripened mango peels can be a suitable carrier for the formulation of solid dispersion of clopidogrel which not only enhances the solubility but also resulted in the enhanced antiplatelet activity.

Key words: Pectin, Solid Dispersion, Clopidogrel, DDSolver, Mean Dissolution Time.

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INTRODUCTION

Primarily, the oral route of drug administration has been used extensively for drug delivery. However, copious drugs remain poorly bioavailable when administered by this route that could be due to either low mucosal permeability of the drug or low solubility of the compound, resulting in low dissolution rate in the mucosal fluids and elimination of a fraction of the drug from the alimentary canal prior to absorption. Other reasons could be due to lack of stability in the gastrointestinal environment which leads to the degradation of the compound prior to its absorption.

In spite of all, the oral route of drug delivery is still most preferred by the vast majority of patients since oral delivery is one of the simplest, safest route, does not pose the sterility problem and the risk of damage at the site of administration is also minimized.²

Drugs which are sited under Class II of Biopharmaceutical Classification System for drugs, having lower rate of dissolution thereby showing decreased bioavailability can be formulated into solid dispersions. Aqueous solubility of these drugs can also be improved by formulating them into



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Article Detail

Possible potential treatment strategies against novel coronavirus SARS-CoV-2

Author: UPASANA THAKUR, AMIT KUMAR, RINU RANA, MAHENDRA SINGH ASHAWAT

Abstract: SARS-CoV-2 initiated as an outbreak from Wuhan in China in December 2019, and spreads globally. SARS-CoV-2 is a positively stranded RNA virus which belongs to the category of beta coronavirus of the family Coronaviridae. This novel Corona virus structurally resembles with the previous SARS-CoV which spread in 2002. Many treatment strategies can be effective against this novel corona virus. This novel corona virus SARS-CoV-2 resembles in features with another virus, SARS-CoV, which spread in 2002. Taking this in account the therapeutic agents which was used for the prevention of SARS-CoV can be used as potential agent for prevention of this novel corona virus. The main focus of the present study was to review the application of various chemotherapeutic agents, anti-viral or non-anti-viral agents for the treatment of SARS-CoV-2. The study also covers potential immunotherapy strategies, vaccine development, herbal formulations and nutrient combination as immunity boosters to combat with this pandemic disease.

Keyword: SARS-CoV-2, coronavirus, treatment, vaccines, herbal treatments, immunity boosters.

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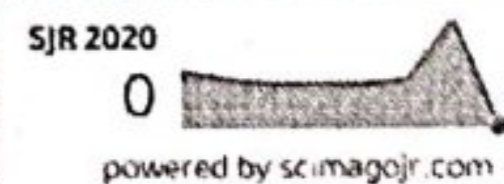
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RESEARCH ARTICLE

Simultaneous estimation of Halobetasol propionate and Tazarotene in pure and dosage form by using UV-Visible Spectrophotometric method

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ABSTRACT:

The easy, simple and rapid spectrophotometric method (simultaneous equation method) have been generate for Halobetasol and Tazarotene drugs. These drugs are available in the form of gel, lotion, creams etc. The absorbance spectrum (λ -max) of Halobetasol propionate was found to be 238nm and Tazarotene was found to be 352nm. The linearity of both Halobetasol and Tazarotene was found between 2-10 μ g/mL. The precision as well as accuracy of the developed method was performed statically. The reproducibility of the developed method was good, whereas recovery in %RSD is less than 1. From the analytical and statistical data of this developed method, it was concluded that this method is useful for laboratory spectrophotometric analysis of Halobetasol and Tazarotene from given formulation samples. The aim of doing this research work is due to the combination formulation phase-3 trial is in progress for both of these drugs. The Halobetasol is topical corticosteroid whereas Tazarotene is third generation topical retinoid. The purpose of the combinational formulation is to develop potent treatment for skin diseases like psoriasis. To decrease or avoiding the adverse effects of Halobetasol like skin roughness, skin dryness, itching, Tazarotene was selected in combination because of its counter effects on the adverse effect of Halobetasol.

KEYWORDS: Halobetasol, Tazarotene, Simultaneous equation method, Linearity, Precision, LOD, LOQ.

INTRODUCTION:

The Halobetasol propionate (Molecular Formula- $C_{25}H_{31}ClF_2O_5$) (Fig. 1) is a topical corticosteroid used in the treatment of skin diseases like psoriasis. The mechanism of action of Halobetasol is by diffusing across cell membranes and then its interaction with receptors known as cytoplasmic corticosteroid, located in dermal cells as well as intradermal cells.^{1,2}

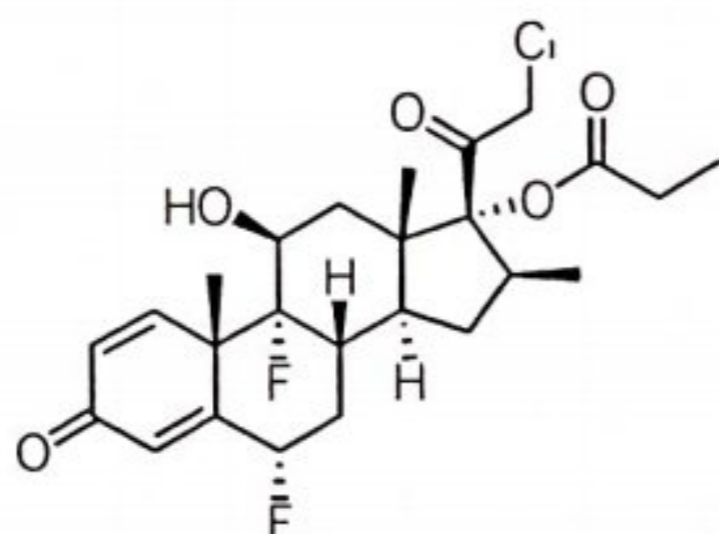


Fig. 1: Chemical structure of Halobetasol propionate

The Tazarotene (Molecular Formula- $C_{21}H_{21}NO_2S$) (Fig. 2) is third generation topical retinoid prescribed in the form of topical gel, cream, lotion etc. It is a specific retinoid having efficacy in the topical treatment of psoriasis.³

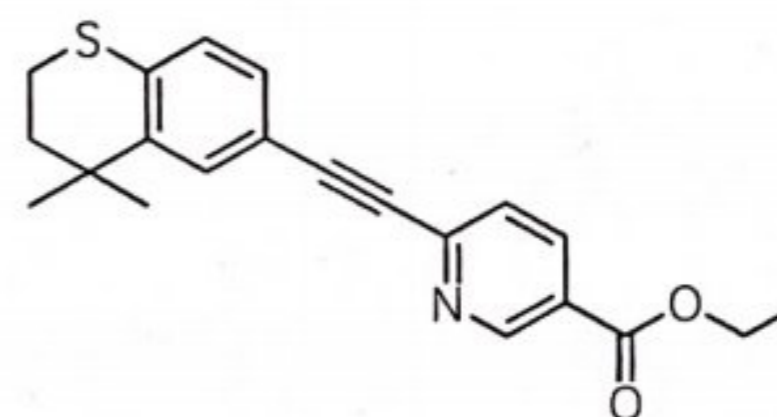


Fig. 2: Chemical structure of Tazarotene

UV spectrophotometric methods have been reported for the simultaneous estimation of various drugs in various pharmaceutical products. The spectrophotometric method is not reported for simultaneous estimation in combination of Halobetasol propionate and Tazarotene. In our research work, we developed a simultaneous equation method has been made for both these drugs in combination.⁴



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Topical delivery of Tacrolimus using liposome containing gel: An emerging and synergistic approach in management of psoriasis



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Keywords:

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ABSTRACT

Psoriasis is a chronic relapsing inflammatory and hyperproliferative skin disease affecting quality of life. It affects an estimated 8 million Americans and more than 125 million people worldwide. The estimated cost to treat psoriasis in USA is over 13 billion US dollars per year. Treatment of psoriasis may include topical steroid-sparing agent, topical corticosteroids, phototherapy or biologics. Tacrolimus has 10-fold greater immunosuppressive activity than the ciclosporin A which has been recommended for effective treatment of psoriasis. However, it has been widely investigated using conventional formulation approaches which limit its clinical outcomes. It has poor cutaneous bioavailability when administered topically using conventional delivery approach, thus it has poor efficacy against the psoriasis. Low aqueous solubility and high degradation of Tacrolimus make it difficult to formulate as a liquid preparation. Moreover, Tacrolimus has narrow therapeutic index and thus it is essential to prevent its possible toxic effects when a modified release dosage form is administered. The present hypothesis aims to put forward to incorporate Tacrolimus into a novel lipid based nanocarrier system, which would be further loaded into a hydrogel base and evaluated for its target specific topical delivery. Due to the structural similarity of the lipid nanocarriers and skin, these vesicles would target the skin tissues effectively and treat psoriasis with minimum or no side effects. Thus, the proposed formulation would be a considerable value addition to the current therapeutic approaches used for psoriasis management.

Introduction

Psoriasis is a chronic inflammatory, systemic immune-mediated disease affecting more than one hundred twenty-seven million individuals worldwide [1,2]. The disease is characterized by the presence of red to white flaking lesions over the body areas include scalp, ears, hands and limbs [3–5]. Psoriasis is the disease which welcomes various medical comorbidities such as kidney disease [6,7] metabolic and endocrine disorders [8–12], autoimmune diseases [13–15], lungs or respiratory diseases [16,17], and gastrointestinal and intestinal disorders [18]. It is greatly associated with psychological disorders as it disturbs the quality of life [19–22]. Mechanisms associated for the disease are not been fully explored. The disease-causing factors include genetic factors, environmental factors, immunological mechanisms, new blood vessel formation, lipid metabolism disorders etc. [23,24].

Stratum corneum (SC) limits the permeation of drugs into the target tissues via topical route. Penetration enhancers are commonly added in topical formulations to increase the penetration of drug through the

skin. An ideal topical drug delivery carrier should allow high penetration through SC. It should not induce any irreversible changes to the skin barriers [25–27].

Current treatments approaches for psoriasis include phototherapies, topical therapies, conventional systemic therapies and biological approaches [28]. Topical therapies include vitamin D derivatives, glucocorticosteroids and calcineurin inhibitors. TNF- α inhibitors (certolizumab, adalimumab, infliximab, and etanercept), P40 subunit of IL-12 and IL-23 inhibitors (ustekinumab), IL17RA or IL-17A inhibitors (brodalumab, ixekizumab and secukinumab), and the P19 subunit of IL-23 inhibitors (risankizumab, guselkumab, IL23 P19 and tildrakizumab) are the common biologic agents of psoriasis. Conventional systemic therapies include ciclosporin, methotrexate and acitretin [1]. Systemic immunosuppressive therapy can cause unwanted side effects. Pharmaceutical scientists are still facing challenges to deliver drugs via topical route as they are unable to regulate and determine the amount of drug which reaches to different layers of skin [29].

Administration of immunosuppressants is recommended for

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Review Article

A Review on Antimalarial 1,2,4-Trioxane Derivatives

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ABSTRACT

Malaria in recent years becomes a major health hitch globally due to the surfacing of multidrug-resistant strains of *Plasmodium falciparum* parasite. In recent times, artemisinin (ART)-based drugs and combination therapies become the drugs of preference for the treatment and prophylaxis of resistant *P. falciparum* malaria. Endoperoxide compounds natural, semi-synthetic or synthetic signifying a massive number of antimalarial agents which possess a wide structural miscellany with needed antimalarial effectiveness against resistant *P. falciparum* malaria. The 1,2,4-trioxane ring system deficient the lactone ring which constitutes the most significant endoperoxide structural scaffold which is believed to be the key pharmacophoric moiety and is principally responsible for the pharmacodynamic potential of endoperoxide-based antimalarials. This becomes the main reason for the research related to endoperoxide particularly 1,2,4-trioxane-, 1,2,4-trioxolane- and 1,2,4,5-tetraoxane-based scaffolds gaining the noteworthy interest in recent years for developing antimalarial drugs against resistant malaria. In this paper, a comprehensive endeavour has been made to review the development of different endoperoxide antimalarial agents and structural diversity of endoperoxide molecules derived from 1,2,4-trioxane- based structural scaffolds.

Keywords: Endoperoxide; 1,2,4-trioxane; pharmacophores; artemisinin; antimalarial.

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1. INTRODUCTION

Malaria is the broadest tropical parasitic disease ¹ and is brought about by contaminations of protozoan parasites of the variety Plasmodium and transmitted to man by specific types of tainted female Anopheles mosquito ². It is one of humankind's oldest and the broadest irresistible diseases on the planet today, exists in more than 100 nations including the United States. Around 40% of the entire population is in danger of malaria contamination, and every year, in excess of 250 million individuals experience malarial ailment and over 1.5 million person's die ³.

1.1. Causative agents

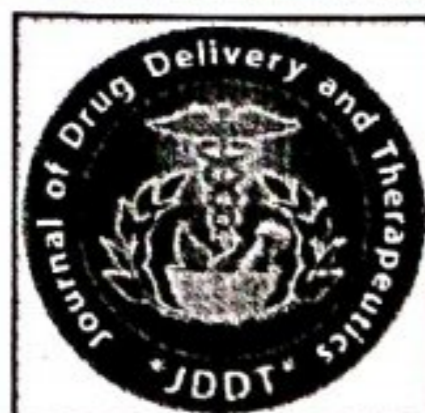
Malaria is brought about by five types of the parasite Plasmodium, to be specific *P. falciparum*, *P. vivax*, *P. ovale*, *P. malariae*, *P. knowlesi* ⁴ of these, *P. falciparum* is mainly perilous and destructive species that cause serious malaria, for example, cerebral malaria ⁵ and is conscientious for the majority of deaths from malaria in humans ⁶⁻¹⁰.

1.2. Signs and symptoms

Malaria infection is usually characterized by the following signs and symptoms such as high fever, diarrhoea, anemia, muscle pain, abdominal pain, convulsions, coma, chill, sweating, bloody stools, headache, vomiting, nausea ¹¹.

1.3. Life cycle of malaria parasite

The life cycle of malaria parasites includes two hosts, humans and Anopheles mosquitoes. The disease is conveyed to human by a bite of an infected Anopheles mosquito that introduces the sporozoites of plasmodia (*P. falciparum*, *P. vivax*, *P. malariae*, *P. knowlesi* and *P. ovale*) into the human's blood ¹². The sporozoites pass through the blood to the liver, where they grown-up, and finally infect the human red blood cells. Intraerythrocytic parasites either continue asexual reproduction to produce more Merozoites, which can attack other erythrocytes or can develop into gametocytes that are capable of infecting the next hungry mosquito. At that point, the parasites enter the stomach of Anopheles mosquito and eventually attack the mosquito salivary organs. When an Anopheles mosquito bites a human, these sporozoites complete and repeat the complicated Plasmodium life cycle ¹³.

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Review Article

A Laconic Review on Extraction, Biological Activities of Herbal Formulations of Berberine: A Traditional Drug

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ABSTRACT

Herbal formulation dosage form consists of one or more herbs processed in specified quantities to provide specific nutritional, cosmetic benefits use to diagnose the disease. Herbal formulations contain an active substance and preparation in combination of one or more herbal compounds. *Berberis aristata* is one of herbs of an ancient Ayurveda medicine and different properties along with various treatment of illness. Berberine, is a type of alkaloid which is quarternary protoberberine, is one of the known bioactive compounds scattered extensively in a number of clinically significant medicinal plants such as *Hydrastis canadensis* L., *Phellodendron amurense* R., *Coptis japonica* M., and Berberine containing plants have been used in traditional and folk medicine around the globe for centuries. It has been used for a, anti-pyretic diarrhea, bitter tonic, and eye infections. In the past three eras, Berberine has been studied intensively in over thousands cases because of its therapeutics, physicochemical effects, pharmacological, and physiological effects such as cardiovascular, anti-inflammatory, anti-leishmanial, and anti-secretory, effects. Berberine act as a phytoconstituents in formulations and available in ayurveda, allopathy, and homeopathy medicines. With this review, we will evaluate the various traditional and medicinal use of Berberine and their isolation and extraction procedure. We will also review the potential of this plant as various dosage forms for the treatment of various diseases.

Keywords: Berberine; Extraction Method; Isolation method; Skin problems

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INTRODUCTION

Now-a-days herbal medicines are widely used and recommend for the treatment of patients health care. Herbal formulation dosage form consists of one or more herbs processed in specified quantities to provide specific nutritional, cosmetic benefits use to diagnose the disease.¹ Herbal formulations contain an active substance and preparation in combination of one or more herbal compounds. Herbal formulations are obtained by extraction, distillation, expression, purification, fractionation include powdered of various crude plants.²

Herbal formulations are inexpensive, and possess good therapeutic action, better for patients' health care. Herbal formulations have no or less side effects as compared to allopathic or other systems. Herbal formulation is used in the treatment of medical conditions, enhancement of bioavailability, pharmacological activity and solubility.³

Ayurveda is a traditional system and improve physical, mental and emotional support for patients. Ayurveda is an ancient medicine healing system. It was developed more than 3000 years ago in India. Ayurveda helps to improve good health, cure disease, preventing and treating disease illness. Ayurveda believe in five basic elements found in universes such as space, air, fire, water and earth and human body systems supports three life energies or forces are known as doshas. Doshas are known as Vata dosha, Pitta dosha and Kapha dosha each controls in different body systems.³

Berberis aristata is one of herbs of an ancient Ayurveda medicine and different properties along with various treatment of illness. Berberine is an active phytoconstituents which is available in ayurveda, allopathy, and homeopathy medicines. The whole part of plant is also good source of dye and tannins. Berberine is main chemical constituents having various pharmacological actions. It is an active constituent

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Research Article

Development and Characterization of Barbaloin Gel for the Safe and Effective Treatment of Psoriasis

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ABSTRACT

Psoriasis is an inflammatory skin disease which cause inflammation to the skin and generally the symptoms includes white or red colour of irregular skin; the patches are developed and they are commonly itchy and scaly to the skin. Barbaloin is an herbal phytoconstituent which is obtained from the plant *aloe vera* leaf part. In the present study hydrogels formulation batches from F1 to F10 were prepared by using carbopol 934, Xanthan gum, carbopol 940, and carbopol 71G NF as a gelling agent. The prepared formulations from F1 to F10 were evaluated for their physical appearance, Grittiness, spreadability, Homogeneity, viscosity, pH, swelling index and microscopical evaluation. The changes in each evaluation parameter were examined at multiples concentration of each polymer. The effects of gelling agent in each formulation were observed and it will help us to justify the suitable range of polymer as a single or in combination with other gelling agent. From these studies it was found to be formulation F2, F4, F7 and F10 showing good gelling properties and further these four formulations are selected for *In Vitro* drug release studies. By *In Vitro* drug release kinetics study formulation F2 and F10 showed higher release as compared to F4 and F7. Furthermore, formulation F2 and F7 had good kinetic release study and showed non fickian drug release as the n value was between 0.8-0.9. Therefore, from the above release study parameters formulation F2 and F10 show the best optimized release characteristics as compare to the selected optimized formulations F4 and F7.

Keywords: Psoriasis, Barbaloin, Hydrogel, Formulation and Evaluation.

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INTRODUCTION

Psoriasis is an enduring autoimmune disease which causes inflammation to the skin. Psoriasis is categorized by different clinical manifestations and each class of psoriasis is characterized by examine the mild, moderate to severe symptoms on skin. These symptoms generally include the white or red colour of irregular skin; the patches are commonly itchy and scaly to the skin.¹ Psoriasis skin is evaluated by itching, red scalps, white scales and rashes are developed on the skin. In psoriasis commonly the skin, joints and nails are affected. However, there are different clinical types of psoriasis are available, but the plaque type of psoriasis is the most common obtainable form of psoriasis which affect most of peoples worldwide. Psoriasis is a non-epidemic infectious disease and terrible skin disorder, which affects the person emotionally, psychologically and clinically.^{2, 3} In the study of (IFPA) International Federation

of Psoriasis Associations, just about the 3 % of the world's population has affected by psoriasis. The estimate is about 125 million peoples.⁴ In India, there is about 10 million cases of psoriasis are observed annually. So according to their increasing growth it enlists under common skin disorder, and at present it is important to doing more work for the treatment of psoriasis.

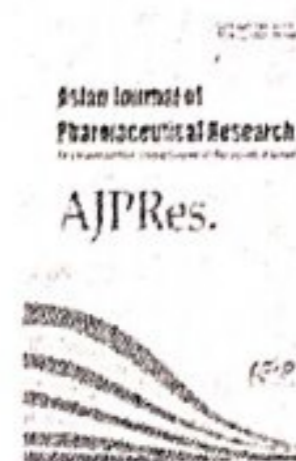
Nowadays, many treatments are available which include topical, biological, systemic agents are used. Some of the agents are helpful to reduce the symptoms of psoriasis but they have some side effects also. In the meantime it is important to develop the treatment with good efficacy and fewer side effects. As compare to allopathic agents the herbal drugs are safer and effective to reduce the symptoms of psoriasis. Because of their minimum adverse effects they are trending in the research.⁵

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REVIEW ARTICLE

Treatment and Management for patients with mild to severe Psoriasis: A Review

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ABSTRACT:

Psoriasis is one of the major chronic disease which causes inflammation to the skin and also it is found to be an auto-immune disorder which affects 3% of the population globally. It can be characterized by evaluating the sign and symptoms and level of disease severity. The chances to develop other diseases in psoriasis are more common. We are focusing on the basic fundamentals of psoriasis as well as their treatment and management. Psoriasis is diagnosed on the basis of physical examination of the body including patient history, skin biopsy, Psoriasis Area Severity Index and Surface Area measurement of our body. The level of severity from mild, moderate and severe can be identified by these tests. However, the main fact that is important to deal with the patients is the prevalence and current scenario of psoriasis. Epidemiologically there are about 125million peoples affected around the world and 10million cases in India are observed annually. Basically many effective therapies are available to manage the symptoms of psoriasis which include topical, systemic, biological, natural herbs as well as phototherapy and combination therapy. Different routes are available for the application of these drugs and they include, topical, oral, intravenous, intramuscular, subcutaneous etc. All these treatments are applied for nourishing the life of patients and with the help of this treatment protocol we can cure and manage the disease.

KEYWORDS: Psoriasis, complications, diagnosis, treatment and management.

INTRODUCTION:


Psoriasis originates from the Greek language which means "itching". It is a lifelong autoimmune disease and examined by white or red colour patches on the skin. These patches are typically itchy and scaly to the person^[1]. In psoriasis there is a chronic inflammatory skin condition which results in imbalance in the immune system and increased epidermal proliferation. It is identified by patches on skin and these patches are basically red in color, dry, itchy and scaly to the patient. The severity of psoriasis varies by identifying the small, localized patches and sometimes the patches cover the whole body of a person^[2].

Psoriasis is linked with insightful functions on the body, psychological changes as well as difficulty in normal living life and some important complications. Nowadays, many effective treatments are available for psoriasis but few are costly. All the required treatments for psoriasis are accessed under the supervision of a specialist^[3]. Psoriasis is a genetically identified immune-mediated and inflammatory skin disease mediated by T-helper cells from (Th1-Th17). It commonly affects each individual and the males are affected more than females. In psoriasis, it extensively affects the patient's life and also affects their families physically, emotionally and socially. In the mean point the WHO made a recent Global Report on Psoriasis which showed that there are various research gaps in psoriasis regarding epidemiology, etiology, relationship with complications and ways to treat psoriasis^[4].

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List of Publication in 2019

S. No.	Title of Paper	Name of the authors	Department of teacher	Name of Journal	Year of Publication	ISSN number	Impact Factor	Link to website of journal	Link to article/paper/article	Is it listed in UGC care list/Scopus/Web of
1	Grewia asiatica Mucilage: A Smart Gelling Polymeric Material for Pharmaceutical Applications In Vitro Studies	Nitin Gupta, G.T Kulkarni, Pravin Kumar, Rajendra Awasthi	Pharmaceutics	Current Material Science	2019	2666-1462	Nil	https://benthamscience.com/journals/current-materials-science/indexing-agencies/	http://eurekaselect.com/article/102583	Scopus
2	Development and Evaluation of Topical Gel with Aloe vera: Novel Treatment of Psoriasis	Anurag Kumar , Vinay Pandit, Tarun Sharma	Department of Pharmaceutics	Indo Global Journal of Pharmaceutical Sciences,	2019	2249-1023	0.675	https://www.iglobaljournal.com/	http://www.iglobaljournal.com/wp-content/uploads/2020/02/23.-Kumar-et-al.-2019.pdf	UGC care list
3	Psoriasis and its Treatment: A Review	A. Kumar, S. Jindal, M.S. Ashawat, V. Pandit, V. Priya	Pharmaceutics	Journal of Biological and Chemical Chronicles	2019	2454-7476	0.59	https://www.eresearchco.com/biological-chemical-chronicles.html	https://www.eresearchco.com/articles/psoriasis-and-its-treatment-a-review.pdf	UGC care list
4	POTENTIAL OF HERBAL NANOCARRIER FORMULATION FOR THE TREATMENT OF PSORIASIS	Jindal S, Awasthi R, Singare D, Kulkarni GT	Pharmaceutics	International Journal of Pharmacy & Life Sciences	2019	0976-7126	0.88	http://www.ijplsjournal.com/home.html	https://web.p.ebscohost.com/abstract?direct=true&profile=ehost&scope=site&authtype=crawler&irnl=09767126&AN=137717734&h=VF0VhoGsqn2csx	UGC care list


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RESEARCH ARTICLE



BENTHAM SCIENCE

Grewia asiatica Mucilage: A Smart Gelling Polymeric Material for Pharmaceutical Applications *In Vitro* Studies



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Abstract: Background: Natural plant-based materials have several advantages. They are biodegradable, biocompatible, non-toxic, cost-effective, environment friendly, easily available, and can undergo chemical modification.

Objective: *Grewia asiatica* extracts contain various phytoconstituents and have therapeutic benefits such as antimicrobial and anti-diabetic properties. They form colloidal dispersions and make a highly viscous gel in water. Considering these properties of *Grewia asiatica* mucilage, the present work was aimed to investigate its application in the formulation of gel for the topical delivery of diclofenac sodium.

Methods: Gel formulations were prepared with and without penetration enhancers using 1% w/w diclofenac sodium as a model drug. The formulations were subjected to different evaluation tests like physical characterization, pH, spreadability, skin irritation, gel retrogradation, drug content and *in vitro* drug diffusion. The *in vitro* diffusion of the drug from different formulations was compared with the *in vitro* drug release profile of the marketed formulation (Omni gel, Cipla, India). To assess the release mechanism, the *in vitro* release data was analyzed using Korsmeyer's-Peppas' equation.

Results: The mucilage showed good gelling behavior in 5.50, 5.75, 6.00, 6.25 and 6.50% concentrations. All the formulations followed the anomalous transport mechanism of drug release. The formulation BP₃ showed 90% of drug release after 5.2h of dissolution study, which was similar to the marketed formulation. Hence, formulation BP₃ was ideal among all the formulations.

Conclusion: It might be concluded that, the *Grewia asiatica* mucilage may be used as a natural polymeric material for gel formulation.

Keywords: *Grewia asiatica*, mucilage, pharmaceutical excipient, korsmeyer's-peppas's model, similarity factor, dissimilarity factor, skin irritation, spreadability.

1. INTRODUCTION

Jellies are the transparent or translucent, non-greasy, semisolid materials containing high-molecular-weight polymers. These are generally applied topically and are used for treating the scalp and other hairy areas of skin, as a lubricant and have other miscellaneous applications [1]. Instead of dissolving, these materials form colloidal dispersions and make a highly viscous gel with clarity values often greater than 95% transmittance. They exhibit properties like swelling, syneresis *etc.* [2]. Gels may contain additional ingredients such as penetration enhancers, preservatives, antioxidants and stabilizers [3].

Natural plant based materials when compared with synthetic polymers in the pharmaceutical field have several

advantages as they are biodegradable, biocompatible, non-toxic, cost-effective, environment friendly, easily available, and can undergo chemical modification. Most of the synthetic polymers are costly, non-biodegradable, and toxic, create environmental pollution during processing, non-renewable, cause side effects and have poor patient compliance. Considering all these factors, even though the plant-based materials have some limitations like microbial contamination, batch to batch variation, uncontrolled rate of hydration, reduced viscosity on storage, the plant sources are more prominent, effective and are better materials as excipients than synthetic polymers. Nowadays, there are a number of plant-based pharmaceutical excipients that are used as binders, diluents, disintegrants, protective colloids, thickener, gelling agents and suppository bases. Plants contain mucilages when mixed with water, a protective and soothing preparation result, which can be applied externally [4].

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Development and Evaluation of Topical Gel with *Aloe vera*: Novel Treatment of Psoriasis

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Keywords
Anti-psoriatic
Drug; Herbal
Formulation;
Natural Product.

ABSTRACT: The present studies aim that development and evaluation of topical gel with aloe Vera novel treatment for psoriasis. Topical gel formulation was designed by using Aloe Vera in varied concentration. The gel was prepared by using cyclosporine as drug with other excipients such as carbopol 940, methanol, propylene glycol, methyl paraben, propyl paraben, tri-ethanolamine and required amount of water. The prepared gel was evaluated for physical appearance, PH, spread ability, drug content, swelling index, diffusion study, viscosity, homogeneity, extrudability, and grittiness. It was inferred from that gel formulation were good in appearance and homogeneity. The prepared herbal gel is very useful for the anti proliferative and anti-inflammatory action for the treatment of psoriasis. © 2019 iGlobal Research and Publishing Foundation. All rights reserved.

Cite this article as: Kumar, A.; Pandit, V.; Sharma, T. Development and Evaluation of Topical Gel with *Aloe vera*: Novel Treatment of Psoriasis. Indo Global J. Pharm. Sci., 2019; 9(2Suppl.): 125. DOI: <http://doi.org/10.35652/IGJPS.2019.92S23>.

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Psoriasis and Its Treatment: A Review

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ABSTRACT: The psoriasis is chronic skin disease that causes the symptoms like abnormal skin cell growth, red circles, patches etc. It is also known as erythematous papules with silvery scales. The two types of study are used for the pathologic changes on the cellular levels. The most of cases comes in the age observed age in between the ages of 15 and 30. In the study, the reason for psoriasis disease is due to a genetic susceptibility as well as an environmental response. The estimated annual cost \$32.5 billion for treating psoriasis in United States. There are number of available marketed treatment for psoriasis in different formulations like topical and systemic formulations. But, topical formulation was considered as best potent method as compared with systemic one due to the less adverse effects and targeted methods. Herbal, homeopathic approaches are also helps to control the growth of psoriasis with low side effects as compared with topical allopathic drugs.

Keywords: Psoriasis; Pathology; Mediators; Potent and Methotrexate.

INTRODUCTION: Psoriasis is an autoimmune chronic inflammatory skin disease. It is characterized by erythematous papules or plaques with silvery scales. Basically, this disease causes the circles or patches of abnormal skin cell generation.¹ It is observed as increased in proliferation of epidermal layer related to defaulted immune system function. The observed psoriasis skin patches are typically red in the color, lack of moisture or dry skin, itching on inflamed skin portion. The psoriasis initiated from small, localized patches to coverage of complete body. The first case of psoriasis was described in Ancient Rome by Cornelius Celsus. The British dermatologist Thomas Bateman described a link between psoriasis and arthritic symptoms in 1813.² The word *psoriasis* derived from the Greek word "psora" stands for "itch". For detailed studies, psoriasis categorized in different classes as plaque psoriasis, invasive psoriasis, psoriatic arthritis, scalp psoriasis, nail psoriasis and many more. In International Federation of Psoriasis Associations (IFPA), around 3% of the world population has some symptoms of psoriasis (125 million people). In India, more than 10 million cases per year observed. Due to the increasing number of cases, it comes under common category. Therefore, inspiration comes in scientists that we need to do more efforts on the psoriasis treatment.^{1,2}

The most commonly observed age of psoriasis is in between the ages of 15 and 30. In 21st century, the available treatment can be helpful to patient treatment, but the drawback is this condition cannot be completely cured. There is around one-third of the population with psoriasis report in history of this disease and scientists have identified the genetic causes that will associate with these condition. There is around 70% chance of identical twin to have chances of a twin developing psoriasis if the other twin has the disorder. The same possibility is around 20% for non-identical twins.^{1,2,3} These observations gives idea that the both a genetic susceptibility as well as an environmental response leads in development the psoriasis. There are around estimated annual cost \$32.5 billion for treating psoriasis in US. The main source of direct expense is pharmacy as well as the biologic therapy also. In case the presence of other conditions heart disease, hypertension, diabetes, lung disease, psychiatric disorders etc. are the factors that will leads in increasing treatment costs.⁴

Psoriatic Pathophysiology: The excessive growth of skin epidermal cells is known as the psoriasis skin disorder (T lymphocyte-mediated autoimmune disease). There are study of pathologic change on the cellular levels (both in epidermis and dermis). The two main procedures occur in development of psoria-

POTENTIAL OF HERBAL NANOCARRIER FORMULATION FOR THE TREATMENT OF PSORIASIS.

- **Source:** International Journal of Pharmacy & Life Sciences . Jun2019, Vol. 10 Issue 6, p4-4. 1p.
- **Author(s):** Jindal, Shammy; Awasthi, Rajendra; Singare, Dhananjay; Kulkarni, G. T.
- **Abstract:** Psoriasis is an inflammatory skin disease affecting 2-3% of the world population. With increasing understanding of the progress of disease and its causes, bacterial infection is reported to be one of the potential reasons. In this regard, water extract of kalmegh has potential activity in the treatment of psoriasis. Despite many topical formulations of allopathic drugs, various drugs in practice, drug delivery issues like permeability in the prevailing infectious conditions and stability of the drug are yet the challenges not been covered so far from the formulation development perspective. For these issues, nanocarrier, on account of their carrier-specific properties, has been suggested as delivery tools to fulfill the expectations. In the present work, Nanocarrier containing herbal extract of kalmegh, were prepared and characterized for its varied traits such as size (536-748 nm), surface charge, morphology, percent skin permeation (53.7%), and retention (1.420 ± 0.5 mg/cm²). Confocal laser scanning microscope (CLSM) images revealed appreciable cell-uptake of fluorescent dye loaded nanocarrier. In vivo studies using the immiquimod induced mouse model, was used and showed significant anti psoriatic activity as compared to standard marketed formulation. Hence, the work suggests for the possibility of a better herbal nanocarrier formulation as a potential option in addressing the infectious challenges of psoriasis.
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List of Publications in 2018

S. No.	Title of Paper	Name of the authors	Department of teacher	Name of Journal	Year of Publication	ISSN number	Impact Factor	Link to website of journal	Link to article/paper/abstract of the article	Is it listed in UGC care list/Scopus/Web of Science/other, mention
1	Anti-Leishmanial Activity of Flavanone Analogues Targeting Pteridine Reductase	Afroze Alam, Vinay Pandit, Shailendra Kumar, Kamlesh Kumar Naik, Mahfoozur Rahman, Mohan Lal Verma	Pharmaceutics	INDIAN JOURNAL OF PHARMACEUTICAL EDUCATION AND RESEARCH	2018	00195464	0.638	https://www.ijper.org/	https://www.researchgate.net/publication/325759597_Anti-Leishmanial_Activity_of_Flavanone_Analogues_Targeting_Pteridine_Reductase	SCOPUS , UGC APPROVED


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Anti-Leishmanial Activity of Flavanone Analogues Targeting Pteridine Reductase

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ABSTRACT

Most available anti-leishmanial drugs are subject to resistance, cause meaningful side effects and sometimes severe toxicity, and are expensive. For these reasons, there is a need to develop novel compounds which should not only be efficacious and less toxic but also cost-effective. The present study was carried out with the aim to develop new synthetic anti-leishmanial agents based on an *in silico* approach of targeting pteridine reductase. This enzyme is a member of oxido-reductase family, which has become an attractive target for the development of novel anti-leishmanial agents. The starting materials for the synthesis of test compounds were 2'-hydroxypropiohenones, 2'-hydroxyacetophenone and substituted benzaldehyde. Test compounds were synthesized in three steps reaction starting from condensation, cyclization and reduction to yield 3-substituted flavanone analogues. The structures of the test compounds were elucidated and established by UV, IR, ¹H-NMR, ¹³C-NMR and mass spectrometry. The synthesized compounds were screened by *in vitro* anti-leishmanial assay against promastigotes of *L. donovani*. Estimated free energy of binding were determined and ranged in between -5.34 to -7.69 k cal/mole. Most of the compounds exhibited moderate leishmanicidal activities, while some compounds such as 4b, 10b, 5b, and 3a have shown promising anti-leishmanial activity against promastigotes of *L. donovani*, were also in good tune with docking results. Docking study of ligands into the active site of Pteridine reductase was led to identify best lead molecules. The top-ranked compound 10b showed promising anti-leishmanial activity.

Key words: Anti-leishmanial activity, Cobalt (II)phthalocyanine, Flavanone derivatives, *L. donovani*, Promastigotes.

INTRODUCTION

Leishmaniasis is a vector-borne disease and considered as one of the world's most neglected diseases. The annual global incidence of leishmaniasis is approximately 12 million cases.¹ Leishmaniasis is endemic in 88 countries with more than 350 million peoples are at risk.^{2,3} The number of cases reported globally has increased over the past 10 years due to the increase in anti-leishmanial drug resistance and lack of adequate vector or reservoir control tools.⁴ Antimonial

compounds are the first line drugs and drug of choice for the treatment of leishmaniasis but the emergence of drug resistance against these drugs is an emerging problem and spread of drug resistance strains of *Leishmania* is an alarming feature. Newer drugs like Miltefosine and Amphotericin B is approved for the treatment of leishmaniasis are highly toxic and above all are very expensive. Thus, the control of leishmaniasis has become a costly affair due to the high cost of

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List of Publication in 2017

S. No.	Title of Paper	Name of the authors	Department of teacher	Name of Journal	Year of Publication	ISSN number	Impact Factor	Link to website of journal	Link to article/paper/abstract of the article	Is it listed in UGC care list/Scopus/Web of Science/other, mention
1	Recent advancement and Technological aspects of pulsatile drug delivery systems.	Vinay Pandit, Ajay Kumar, C P S Verma, Mahendra Singh Ashawat, Pravin Kumar	Pharmaceutics	Current Drug Targets	2017	1873-5592	3.465	https://benthamscience.com/journals/current-drug-targets/	http://eurekalect.com/article/73542	Web of Science
2	Anticancer activity of Amino acid linked Novel 4-Methylumbelliferone derivatives	Manish sinha, Rohit Bhatia	Department of Pharmaceutical chemistry	Current Bioactive Compound	2017	1573-4072	1.3	https://benthamscience.com/journals/current-bioactive-compounds/volume/15/issue/1/	http://dx.doi.org/10.2174/1573407213666170210143503	Scopus, Google scholar, EBASCO


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Review > Curr Drug Targets. 2017;18(10):1191-1203. doi: 10.2174/1389450117666160208144343.

Recent Advancement and Technological Aspects of Pulsatile Drug Delivery System - A Laconic Review

Vinay Pandit¹, Ajay Kumar¹, Mahendra S Ashawat¹, Chander P Verma¹, Pravin Kumar¹

Affiliations + expand

PMID: 26853323 DOI: 10.2174/1389450117666160208144343

Abstract

Background: Pulsatile drug delivery system (PDDS) shows potential significance in the field of drug delivery to release the maximum amount of drug at a definite site and at specific time. PDDS are mainly time controlled delivery devices having a definite pause period for drug release, which is not affected by acidity, alkalinity, motility and enzymes present in the gastrointestinal tract. Pulsatile medication possess the potential to deliver the drugs in the therapy of diseases where drug dose is essential during sleep, drugs having greater first pass metabolism and absorption at precise location in digestive tract.

Objective: The review article, discuss the general concepts, marketed formulations and patents or any other recent advancement in pulsatile release technology. It also highlights on diseases requiring therapy by pulsatile release, various researches on herbal pulsatile formulations and quality control aspects of PDDS.

Conclusion: Pulsatile medication possess the potential to deliver the drugs in the therapy of diseases

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RESEARCH ARTICLE

Anticancer Activity of Aminoacid Linked Novel 4-Methylumbelliferone Derivatives

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Abstract: Background: Cancer is a disease of high mortality. The therapeutic agents currently available are insufficient to cure it and are associated with serious side effects. 4-methylumbelliferone is a natural product containing benzo- α -pyrones as a central nucleus. Benzo- α -pyrone is a privileged moiety having multifarious biological activities including anticancer activity. A series of compounds were synthesized taking 4-methylumbelliferone as a core nucleus and screened for their anticancer activity against HeLa cancer cell line.

Method: The 4-methylumbelliferone was linked with aminoacids using chloroacetyl chloride or ethyl chloroacetate as linker. The N-methylmorpholine and isobutylchloroformate protocol was used for amidic coupling. The final compounds were tested against the HeLa cancer cell lines using SRB assay protocol.

Results: Three compounds have shown significant anticancer activity viz 9a, 12f and 15l having GI₅₀ (μ g/ml) value of, 56.1, 30.9 and 50.9, respectively. Other compound 9f and 13 showed weak anticancer activity having GI₅₀ (μ g/ml) value of 97.2 and 71.1, respectively.

Conclusion: It has been found that the synthesized derivatives have inhibitory effect on the growth of cancer cell line. Compound 12f has been found as the most active compound of the synthesized series.

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1. INTRODUCTION

4-methylumbelliferone is a natural product having benzo- α -pyrone nucleus 1. They have been proved a potential candidate for new drug development due to their diversified biological activities including anti-HIV [1-4], anticoagulant [5], antibacterial [6, 7], anticancer [8], antihelminthic [9], anti-inflammatory [10-12] and antioxidant activities [13-15].

The study of different coumarin derivatives showed that selection of substitution group is very important for targeting various biological activities. 4-methylumbelliferone and its derivatives exhibit good anticancer activity but still the lead optimization is incomplete. This requires an urgent need of further exploration of biophoric space around it.

The derivatization of 4-methylumbelliferone by coupling it with α -aminoacids, *o*-aminobenzoic acid and *p*-aminobenzoic acid is an attractive approach for drug design. The α -aminoacids are the basic building blocks of cell membrane, receptors and enzymes [16] while aminobenzoic acids (*o*-aminobenzoic acid 2, *m*-aminobenzoic acid 3 and *p*-aminobenzoic acid 4; Fig. 1) are non-protein amino acids

that are widely distributed in the nature. *o*-aminobenzoic acid is a constituent of many bioactive compounds that exhibit a range of biological activities. Specifically, the nucleus of anthranilic acid is a biochemical precursor of amino acid, their derivatives and several alkaloids [17].

PABA (*p*-aminobenzoic acid) is a component of pteroylglutamate and a part of folic acid [18]. The folic acid synthesis inhibition is utilized by methotrexate a potential anticancer drug.

PABA induces endogenous interferon production and manifests antiviral properties [19, 20] reduces the mutagenicity of various chemical mutagens [21, 22] shows a radio protective effect [23], reduces cis-diamminedichloroplatinum (II) nephrotoxicity [24, 25] which has anticoagulant activity [26] and in combination treatment with antibiotics has synergistic inhibitory activity against *Pseudomonas aeruginosa* and *Staphylococcus aureus* [27].

2. MATERIALS AND METHOD

2.1. Chemistry

The synthesis of 4-methylumbelliferone derivatives is outlined in Schemes 1-3.

The resorcinol 5 was reacted with ethyl acetoacetate in H₂SO₄ at 0°C by stirring for half an hour. The solution was

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