3.3.1 Number of research papers published per teacher in the Journals notified on UGC website during the last five years

S. No.	Title of paper	Name of the author/s	Department of the teacher	Name of journal	Year of publication	ISSN number	Link to the recognition in UGC enlistment of the Journal /Digital Object Identifier (doi) number		
							Link to website of the Journal	Link to article / paper / abstract of the article	UGC
1	Strategic Approaches and Evaluation of Gastro Retentive drug delivery system-A review	Ch. Taraka Ramarao,Balijepalli Murali Krishna , Chandra Sekhar Patro , Praveen Kumar Uppala	Pharmaceutical Technology	Neuro Quantology	2022	1303-5150	https://www.neuroquantology.com/	https://www.neuroquantology.com/open-access/STRATEGIC+APPROACHES+AND+EVALUATION+OF+GASTRO+RETENTIVE+DRUG+DELIVERY+SYSTEM-+A+REVIEW_5155/	Scopus
2	Formulation and evaluation of novel insitu gel system in the management of rheumatoid arthritis.	B. padmasri, Dr. R. Nagaraju	Department of Pharmaceitical Technology	International journal of applied pharmaceutics	2022	Online ISSN: 0975–7058	https://journals.innovareacademics.in/index.php/ijap	https://journals.innovareacademics.in/index.php/ijap/article/view/43792	scopus
3	Statistically 2 Level Factorial by Design Expert: In-vitro Design and Formulation of Levitiracetam Extended Release Tablets.	Ch. Taraka Ramarao, Somireddy. Madhuri.	Pharmaceutical Technology	Indian J of Pharmaceutical Education and Research	2022	0019-5464	https://www.ijper.org/	https://www.ijper.org/article/1814	Scopus

4	**Experimental Design Statistically by Design Expert Software: A Model Poorly Soluble Drug with Dissolution Enhancement and Optimization**	**Ch. Taraka Ramarao, Reshma.K.**	**Pharmaceutical Technology**	**International Journal of Drug Delivery Technology**	**2022**	**0975 - 4415**	https://ijddt.com/	https://ijddt.com/volume12issue3/	Scopus
5	**Synthesis of ultra small nano tio2 and their antibacterial activity under dark and uv light**	**S.V.N.Pammi,V.S.KsheeraBhavani.A,N.L.D.Bhavani,R.L.Kalyani**	**Pharmaceutics**	**NEUROQUANTOLOGY**	**2022**	**1303-5150**	https://www.neuroquantology.com/	https://www.neuroquantology.com/open-access/Synthesis+of+Ultra+Small+Nano-TiO2+and+their+Antibacterial+Activity+under+Dark+and+UV+Light_7386/	UGC
6	**STATISTICALLY OPTIMIZATION AND FORMULATION DEVELOPMENT OF BROMOFENAC SODIUM OPHTHALMIC DRUG DELIVERY SYSTEM**	**Ch. Taraka Ramarao, Preethi.G**	**Pharmaceutical Technology**	**Suranaree Journal of Science & Technology**	**2022**	**0858-849X (print)2587-0009 (online)**	https://ird.sut.ac.th/journal/sjst/#/home	https://ird.sut.ac.th/journal/sjst/#/los/manuscript/25350	Scopus
7	**In-vitro Design and Formulation of Levitiracetam Extended Release Tablets.**	**Ch. Taraka Ramarao, Somireddy. Madhuri.**	**Pharmaceutical Technology**	**Research Journal of Pharmacy and Technology**	**2022**	**0974-360X (Online)**	https://www.rjptonline.org/AboutJournal.aspx	https://www.rjptonline.org/AbstractView.aspx?PID=2022-15-8-59	scopus

8	**Formulation development of Ezetimibe by using Soluplus and Co-Processed Acacia: tragacanth with Design Expert**	**Ch. Taraka Ramarao, Jami.Ravali**	**Pharmaceutical Technology**	**Health Biotechnology and Biopharma (HBB),**	**2022**	**0974-3618 (Print)**	https://www.healthbiotechpharm.org/	https://www.healthbiotechpharm.org/article_158277.html	Scopus
9	**Shape Controlled Synthesis of Cu2Se Nanostructures and Their Effect on the Performance of Photocatalytic Dye Degradation of Nitrobenzene under Visible Light Illumination**	**S.V.N.Pammi , G. Thirumala Rao, M. Ravichandra, R. L. Kalyani**	**Pharmaceutics**	**Neuroquantology**	**2022**	**1303-5150**	https://www.neuroquantology.com/	NeuroQuantology|July2022|Volume20|Issue8|Page8735-8740|doi:10.14704/nq.2022.20.8.NQ44895 S.V.N.Pammi et al/ Shape Controlled Synthesis of Cu2Se Nanostructures and Their Effect on the Performance of Photocatalytic Dye Degradation of Nitrobenzene under Visible Light Illumination	UGC
10	**Tosars-Cov-2-ACE2 Binding Interference as a Promising New Strategy for Micro-Inhibition of Respiratory Pathogens on Nasal-Oral Epithelium: An Initial On-Screen Study**	**R.L. Kalyani , B. Padmasri , N.Phani satyavathi , P. Devi**	**pharmaceutics**	**HMS**	**2022**	**ISSN:1300-669**	https://hmsjournal.com/issues.php?id=126	https://hmsjournal.com/admin/uploads/possible-interference-in-protein-ndash-protein-interaction-as-a-new-approach-in-micro-inhibition.pdf	UGC

11	**Protective Effect of Withania Somnifera Bleomycin Induced Pulmonary Fibrosis in Experimental Rats**	**Dr. N.Phani satyavathi , P. Archana , P. Tarana , S.R.T.P. Ramya**	**Department of Pharmacy Practice**	**HMS**	**2022**	**ISSN:1300-669**	https://hmsjournal.com/issues.php?id=127	https://hmsjournal.com/admin/uploads/protective-effect-of-withania-somnifera-bleomycin-induced-pulmonary-fibrosis-in-experimental-rats.pdf	UGC
12	**High Absolute Lymphocyte Counts Correlate with a Better Outcome After Eribulin Therapy for Metastatic Breast Cancer in First-Line Chemotherapy Studies**	**P. Satish, K. Madhavi , K. Vineetha , B. Jyothsna**	**Department of pharmaceutical analysis**	**HMS**	**2022**	**ISSN:1300-669**	https://hmsjournal.com/issues.php?id=127	https://hmsjournal.com/admin/uploads/the-relationship-between-high-absolute-lymphocyte-counts-and-favorable-prognosis%20(1).pdf	UGC
13	**A Narrative Review of Global Perspective on Illicit Drug Utilization and Substance Use Disorders**	**Paila Bhanujirao, Saman Salari, Paeizi Behzad, Tayebeh Salari**	**Department of Pharmacy Practice**	**Archives of Medicine and Health Sciences**	**2022**	**ISSN 2321-4848**	http://www.amhsjournal.org	https://www.amhsjournal.org/text.asp?2022/10/2/266/364970	UGC

14	Hepatoprotective Effects of Dawa-Ul-Kurkum, a Unani Polyherbal Preparation and the Possible Mechanisms in Experimental Model of Ethanol Induced Liver Damage in Rats	P. Bhanuji rao, L. Renuka , M. Urmila, R. Sailaja	Department of pharmaceutical chemistry	IAJPB	2021	234722 51		https://iajpb.com/iajpbadmin/upload/ijlbpr_651fdfc28b011.pdf	UGC
15	Enhancement of solubility and effect of granulation methods on drug release in sustained release matrix tablets of poorly soluble drug	A.v.s.ksheerabhavani,Alaxmiusha,Eradharani,Avysya murthy	Pharmaceutics	Research journal of Pharmacy and technology	2021	0974-3618	https://doi.org/10.5958/0974-360X.2021.00034.2	https://rjptonline.org/AbstractView.aspx?PID=2021-14-1-34	UGC
16	Novel approach for producing pharmaceuticals in layer by layer fashion :additive manufacturing	LakshmiUshaayalasomayajulu,kishore pathivada,radharani earle,A.V.S.KsheeraBhavani	Pharmaceutics	Indo global journal of pharmaceutical sciences	2021	2249-1023	http://doi.org/10.35652/IGJPS.2021.111010	http://www.iglobaljournal.com/wp-content/uploads/2021/09/10.-Ayalasomayajula-et-al.-2021.pdf	UGC
17	Pharmacokinetics of panaxynol in mice	P. Archana , N. Rajeswari , D.Prasanth , Ch. Shankaranarayana	Department of pharmacology	IAJPB	2021	ISSN 2347-2251	https://iajpb.com/previousissue.php?year=2021&issue=2	https://iajpb.com/iajpbadmin/upload/ijlbpr_651fe115edf2b.pdf	UGC

18	Development and characterization of gastroretentive floating tablets of venlafaxine hydrochloride by thermoplastic granulation technique	A Lakshmikusha ,E radharani,A Vyasa murthy,A.v.s.k sheerabhavani	pharmaceutics	Research journal of pharmacy and lifesciences	2021	2582-6441	https://rjpls.com/2021-volume-2-issue-2-article-6/	https://rjpls.com/2021-volume-2-issue-2-article-6/	UGC
19	Formulation and evaluation of oral antidiabetic insitu gel system of pioglitazone	B. padmasri, Dr. R. Nagaraju	Department of Pharmaceitical Technology	International Journal of Pharmaceutical sciences and Research	2021	ISSN (Online): 0975-8232, ISSN (Print): 2320-5148	https://ijpsr.com/archives-2/	https://ijpsr.com/archives-2/	UGC
20	Cross-linked chitosan based stomach specific mucoadhesive microsphere sloaded with amoxicillin :preparation and exvivo characterization	radharani e ,v vijayabharathi, Alakshmiusha, AVSKsheerabhavani	pharmaceutics	International journal of pharmaceutical investigation	2020	2230-9713	https://jpionline.org/10.5530/ijpi.2020.1.11	https://jpionline.org/10.5530/ijpi.2020.1.11	UGC
21	A comprehensive review on insitu gels	Budumuru Padmasri, Ravoru Nagaraju, Damarasingu prashanth	Department of Pharmaceitical Technology	International journal of applied pharmaceutics	2020	Online ISSN: 0975–7058	https://journals.innovareacademics.in/index.php/ijap	https://journals.innovareacademics.in/index.php/ijap	scopus

22	IN VITRO AND IN VIVO PHARMACOKINETIC EVALUATION OF VALSARTAN TABLETS: OPTIMIZATION BY FACTORIAL DESIGN 2^3	Ch.Tarakaramarao , Chowdary KPR, Rao PR	Pharmaceutical Technology	Indian drugs	2020	0019-462X	https://www.indiandrugsonline.org/	https://www.indiandrugsonline.org/issue-details?year=2020&start=10	Scopus
23	Novel COVID-19 Pandemic Scenario: A Review of the Current Literature	Anilkumar V, Murali Krishna B, Sangeeta Kumari L and Kalyani R	Department of Pharmaeutial tehnology	Acta Scientific Pharmaceutical Sciences	2020	2581-5423	https://actascientific.com	https://actascientific.com/ASPS.php	UGC
24	Edible green solvent for optimized catechins extraction from green tea leaves: Anti-Hypercholesterolemia	K.E.V. Nagoji , D.Prasanth, B.Ramadevi , M. Narendra	Department of pharmaceutical analysis	HMS JOURNAL	2020	ISSN 1300-669	https://iajpb.com/previousissue.php?year=2019&issue=2	https://hmsjournal.com/admin/uploads/edible-green-solvent-for-optimized-catechins-extraction-from-green-tea-leaves-antihypercholesterolemia%20(1).pdf	UGC
25	Determination of Meropenem, Ceftazidime and Piperacillin Levels in Serum andMeropeneminCerebrospinalFluidbyLiquidChromatographyforRoutine Quantication	B.Padmasri , P. Banujirao, V. Anil Kumar, R. Kalyani	Department of Pharmaceutical Technology	HMS JOURNAL	2020	ISSN 1300 669	https://hmsjournal.com/issues.php?id=120	https://hmsjournal.com/admin/uploads/determination-of-meropenem-ceftazidime-and-piperacillin-levels-in-serum-and-meropenem.pdf	UGC

26	Current and future directions in the prevention and treatment of Malaria	Dr. L. Renuka , A.V.S.Ksheera Bhavani , N. Hemanth kumar , A. Hari Krishna	Department of Pharmacy Practice	IAJLB	2019	ISSN 2347 2243	https://iajlb.com/previousissue.php?year=2018&issue=1	https://iajlb.com/iajlbadmin/upload/ijlbps_651fd548a8b68.pdf	UGC
27	Ischemic and Non-Ischemic Heart Disease: A Patient-Specific Approach to Scar Detection Using Cardiac MRI	B.Padmasri , P. Banujirao2 , V. Anil Kumar3 , R. Kalyani4	Department of Pharmacy Practice	IAJPB	2019	ISSN 2347-2251	https://iajpb.com/previousissue.php?year=2019&issue=2	https://iajpb.com/iajpbadmin/upload/ijlbpr_651fefb307b7a.pdf	UGC
28	Design and Characterization of Alfuzosin Hcl Gastroretentive Floating Matrix tablets Employing HPMC K100 M	Ch.Taraka Ramarao, Srinivasarao B and Vijayaratna J	Pharmaceutical Technology	Indian drugs	2018	0019-462X	https://www.indiandrugsonline.org/	https://www.indiandrugsonline.org/issuesarticle-details?id=ODY4	Scopus
29	Analyzing a National Breast Cancer Registry Reveals Age-Related Variation in Lymph Node Metastases and Survival	G. Divya, N. Rajeswari, K. Pavithra, K. Sandeep kumar Reddy	Pharmaceutical Analysis	IAJAVS	2018	ISSN 2321 – 9602	https://iajavs.com/previousissue.php?year=2018&issue=2	https://iajavs.com/iajavsadmin/upload/ijlbpr_651fcff83d14e.pdf	UGC

30	**Antibiotic Resistance Pattern and Biofilm Formation of Staphylococcus and Enterobacteriaceae Isolates from Clinical Samples of Patients with Urinary Tract and Surgical Site Infectionsin Kinshasa, Democratic Republic of Congo**	**A.V.S. Ksheera Bhavani , M.Madhuri , L. Sangeetha kumara, B. Rajesh kumar**	**Department of Pharmaceutical biotechnology**	**IAJLB**	**2018**	**ISSN 2347 2243**	https://iajlb.com/previousissue.php?year=2018&issue=1	https://iajlb.com/iajlbadmin/upload/ijlbps_651fd17feb977.pdf	UGC
31	**PHYTOCHEMICAL SCREENING AND BIOLOGICAL STUDIES ON THE LEAVES OF TINOSPORA CORDIFOLIA**	**B. Ramadevi * 1, K. Sita Kumari 2, D. Prashanth1, A. V. S. Ksheera Bhavani 1 and P. Aswini Lavanya1**	**pharmaceutics**	**International Journal of Pharmaceutical Sciences and Research**	**2018**	**2320-5148**	http://dx.doi.org/10.13040/IJPSR.0975-8232.9(6).2573-78	https://ijpsr.com/?action=download_pdf&postid=42427	UGC
32	**STUDIES ON ACTINOMYCETE ISOLATES FOR PROBIOTIC ACTIVITY**	**Srijana Kasturi*1, A. V. S. Ksheera Bhavani2, M. Madhuri3 and B. Ramadevi**	**Pharmaceutical Biotechnology**	**World journal of pharmaceutical research**	**2018**	**2277–7105**	DOI: 10.20959/wjpr20189-11649.8533	https://wjpr.s3.ap-south-1.amazonaws.com/article_issue/1525422285.pdf	UGC

33	**Sustained Release Matrix Tablets of Diclofenac Sodium Employing Kollidon SR, PEG 6000, Lactose Mono Hydrate and Eudragit S100 in Colon Target.**	**Ch.Taraka Ramarao, Srinivasarao B and Vijayaratna J**	**Pharmaceutical Technology**	**Indian drugs**	**2017**	0019-462X	https://www.indiandrugsonline.org/	https://www.indiandrugsonline.org/issuesarticle-details?id=NzE5	UGC

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Etcherla, Srikakulam-532410 (A.P)

STRATEGIC APPROACHES AND EVALUATION OF GASTRO RETENTIVE DRUG DELIVERY SYSTEM- A REVIEW

Balijepalli Murali Krishna*[1], Chandra Sekhar Patro[2], Ch. Taraka Ramarao[3], Praveen Kumar Uppala[4]

[1]Research Scholar, Centurion University of Technology and Management, Odisha, India.

[2]Professor & Principal, Centurion University of Technology and Management, Odisha, India.

[3]Associate Professor, Department of Pharmaceutical Technology, Sri Venkateswera College Pharmacy, Etcherla, Srikakulam, Andhra Pradesh, India.

[4] Research Scholar, Koneru Lakshmaiah Education Foundation,Guntur,Andhra Pradesh

*Address for correspondence

E-mail: muralimk242@gmail.com

ABSTRACT

The oral route was the most effective and approved method of drug delivery. Because of the enormous therapeutic benefits of orally controlled release dosage forms, improved medicinal benefits are favored as an important perspective in the pharmaceutical field. Gastroretentive drug delivery system (GRDDS) is a novel drug delivery method with the ability to maintain extended stomach retention and thus improve drug stomach residence time as well as drug bioavailability. Many technological methods are used to extend gastric residence time, including swelling and expansion, mucoadhesive, high density, ion exchange, raft forming, magnetic, and floating drug delivery systems. The GRDDSs aimed to bring together various gastroretentive approaches that were previously leading methods in the field of orally administered controlled release drug delivery.

Keywords: Gastro retentive drug delivery system, Controlled release, Floating drug delivery system, Bioavailability, Mucoadhesive

DOI Number: 10.14704/nq.2022.20.7.NQ33097 **NeuroQuantology 2022; 20(7):757-769**

INTRODUCTION

The most convenient and preferred method of drug delivery to the systemic circulation is oral administration. Oral controlled release drug delivery has recently gained popularity in the pharmaceutical industry as a means of achieving improved therapeutic benefits such as ease of dosing administration, patient compliance, and formulation flexibility. Drugs that are easily absorbed from the gastrointestinal tract to achieve adequate therapeutic activity these drugs must be administered on a regular basis (Amit Kumar Nayak et al., 2010)[1]. Gastro retentive drug delivery is an approach of extending gastric residence time, allowing for site specific drug release in the upper gastrointestinal tract (GIT) for local or systemic effects. Gastro retentive dosage forms can remain in the gastric region for extended periods of time and significantly extending drug gastric retention time (GRT). Several gastro retentive drug delivery approaches have been designed and developed over the last few decades including high density (sinking) systems that are retained at the bottom of the stomach, Low density (floating) systems that cause buoyancy in gastric fluid, mucoadhesive systems that cause bioadhesion

International Journal of Applied Pharmaceutics

ISSN- 0975-7058 Vol 14, Issue 5, 2022

Original Article

FORMULATION AND EVALUATION OF NOVEL INSITU GEL SYSTEM IN THE MANAGEMENT OF RHEUMATOID ARTHRITIS

B. PADMASRI[1*], R. NAGARAJU[2]

[1]Department of Pharmaceutical Technology, Sri Venkateswara College of Pharmacy, Etcherla, Srikakulam, [2]Department of Pharmaceutics, Institute of Pharmaceutical Technology, Sri Padmavathi Mahila, Viswa Vidyalayam, Tirupati, Andhra Pradesh
Email: padmasripharma@gmail.com

Received: 07 Dec 2021, Revised and Accepted: 18 Jul 2022

ABSTRACT

Objective: To develop *in-situ* gel formulations of Lornoxicam for sustained release to reduce the dosing frequency in the treatment of rheumatoid arthritis.

Methods: The method of ion-sensitive *in-situ* gel formation was used in this study. Lornoxicam in situ gel formulations were prepared by varying concentrations of sodium alginate as a bio-degradable gel-forming polymer, $CaCl_2$ as a cross-linking agent, and chitosan, $HPMCK_4$, $HPMCK_{15}$, guar gum, gellan gum, xanthan gum, pectin were used as drug release rate controlling polymers. The formulations F11-F18 were assessed for physical appearance, pH, *in vitro* drug release, viscosity, *in vitro* gelling capacity, and drug content. FTIR, DSC, and *in vivo* drug kinetics studies were conducted for lornoxicam pure drug and optimized formulation.

Results: Formulations showed an optimum viscosity that will allow ease of administration and swallowing. All formulations were shown pH between 6.7 to 7.3, floating lag time was 2-3 sec and floated for 12 h. *In vitro*, drug release studies were reporting that commercial sustained release formulation of lornoxicam released 99.92% drug in 8 h, and optimized formulation F11 released 99.52% of the drug over a 12 h extended period. FTIR studies revealed no interaction between drugs and excipients used. The results of *in vivo* kinetic studies are approving the better performance of the optimized formulation. The C_{max}, T_{max}, $t_{1/2}$, and AUC values are confirming the same thing.

Conclusion: Lornoxicam oral *in situ* gel containing chitosan as a drug release controlling polymer is a promising approach for the treatment of rheumatoid arthritis in a convenient dosage form with better patient compliance and therapeutic response.

Keywords: Lornoxicam, Rheumatoid arthritis, *In situ* gels, Sodium alginate, Chitosan

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DOI: https://dx.doi.org/10.22159/ijap.2022v14i5.43792. Journal homepage: https://innovareacademics.in/journals/index.php/ijap

INTRODUCTION

Rheumatoid arthritis is an "autoimmune disorder described by joint inflammation and ache, with progressive bone erosions and cartilage damage, accompanied as a result of synovial hypertrophy" [1, 2]. The causing reason for the disease is unidentified and above 1% of the world population suffers from rheumatoid arthritis; characteristically, the disease commences at the age of 30 to 50 y [3]. An expected 2.5 million individuals in India are pretentious by rheumatoid arthritis, which has an economic impact of billions. About 0.5–0.75% of Asian people have been suffering from rheumatoid arthritis, with a women-to-men ratio of 3:1 [4]. In addition, this promotes the rate of premature death of patients with savage ischemic coronary illness or lymphoma, which extraordinarily affects monetary cost [5, 6].

Despite progressions in fundamental science and therapeutics, the presently available treatments are partially effective because of several disadvantages like drug dosage, time of administration, and related toxicities [7]. The perfect system should be easily administered, release the drug in a sustained manner and optimum concentration of drug must be retained without unpleasant negative activities. A variety of therapeutic agents are obtainable for the management of rheumatoid arthritis consisting of (i) NSAIDs (non-steroidal anti-inflammatory drugs)/selective cyclo oxygenase-2 (COX-2) inhibitors, (ii) Disease-modifying anti-rheumatic drugs (DMARDs), (iii) Glucocorticoids, (iv) Natural origin compounds and (v) Biological agents [8].

Lornoxicam is an exceptionally strong anti-inflammatory nonsteroidal drug; it has been utilized efficaciously in the therapeutic management of an extensive range of inflammatory and painful conditions, for example, moderate to chronic rheumatoid joint inflammation ankylosing spondylitis, and osteoarthritis [9].

The main aim of the study was formulation and evaluation of lornoxicam *in-situ* gel preparation for sustained drug release to reduce dosing frequency in a convenient dosage form for geriatric patients in the treatment of rheumatoid arthritis. Elderly patients with dysphagia are between a rock and a hard place because they require a large number of prescriptions like other geriatric patients [10, 11], but difficulties with swallowing or dysphagia limit or preclude the administration of solid oral dosage forms, which are by the far the most common formulations on the market. The problem could easily be bypassed if all the active pharmaceutical ingredients (APIs) contained in marketed products were available in formulations other than solid oral dosage forms. Unfortunately, this is not the case, and in clinics, compounding is a daily practice as caregivers dispense crushed tablets or opened capsules to facilitate the administration of solid oral dosage forms to dysphagic patients [12]. Hence it is highly needful.

MATERIALS AND METHODS

Lornoxicam was acquired from Glenmark Pharma Private Ltd, Mumbai, India. All the polymers were of pharmaceutical grade. Chitosan, $HPMCK_4$, and $HPMCK_{15}$ were obtained from Lepid Life Sciences Pvt Ltd, Delhi, India, and guar gum, gellan gum, xanthan gum, and pectin were obtained from Sigma-Aldrich, Germany was used as received. Sodium alginate, sodium citrate, and calcium chloride were obtained from SD Fine chemicals, Mumbai, India. All solvents utilized were of HPLC grade. Throughout the study, distilled water was used.

Preparation of lornoxicam *in situ* gels formulation

Ion sensitive *in-situ* gel formation method was employed for the preparation of lornoxicam *in-situ* gels and the formulations were specified in table 1. In the preparation of in situ gels, sodium alginate was used as a gelling agent, sucralose as a sweetening agent, sodium citrate as a sequestering agent and cross-linking agent was calcium chloride; apart from these, polymers like chitosan $HPMCK_4$, $HPMCK_{15}$, guar gum, gellan gum, xanthan gum, pectin were utilized

Original Article

Statistically 2 Level Factorial by Design Expert: *In-vitro* Design and Formulation of Levitiracetam Extended Release Tablets

Challa Taraka Ramarao*, Somireddy Madhuri

Department of Pharmaceutical Technology, Sri Venkateswara College of Pharmacy, Etchrela, Srikakulam, Andhra Pradesh, INDIA.

ABSTRACT

Background: Levitiracetam is an antiepileptic medication that falls into the BCS Class I drug classification. It is used to treat specific types of seizures in adults and children with epilepsy because of its high solubility and permeability. **Aim:** The objective of the present study is to evaluate the extended release tablets of levitiracetam by direct compression using HPMCK100, HPMCK15and Xanthan gum/Ethyl cellulose effect of the dissolution rate by 2 level factorial designs by Design expert software. **Materials and Methods:** The Design Expert software used to 2 level factorial designs, the three independent components of X1: drug: HPMCK 100, X2: HPMC K15 and X3: Ethyl cellulose/Xanthan gum was used to do analysis of variance (ANOVA), 3D surface plots, counter plots, optimization, and desirability. Fourier-transform infrared spectroscopy was used to investigate drug-excipient compatibility. **Results and Conclusion:** The drug release from all the tablets was diffusion control as indicated by the linear Higuchi plots. The release data was analyzed Peppas equation the release exponent (n) was found to be in the range 0.76-0.93. Amount all the levetiracetam tablets prepared formulation F2 formulated employing HPMC K100 60 mg, HMPCK15 25 mg, Xanthane gum 25 mg. In the all cases formulations F1, F3, F4, F5,F8 Indicates nonfickain diffusion and F2, F6, F7 Indicates super case II transport as release mechanism. The formulation F2 was released 100% drug release in a 8 hr. It is fulfill specifications for extended release tablets. The results of ANOVA of dependent variables indicated that the individual and combined effect of the 3 factors is significant ($p < 0.05$). The design expert software used to find 2 level factorial design, surface, counter plots, optimization and desirability. The optimized formula did better on the desirability level (1.0), indicating that it was a good fit. The FTIR spectra of pure drug and mixture with various excipients, indicates no chemical interaction between drug and excipients.

Keywords: Extended release, Design expert software, Levitiracetam, Direct compression, Drug release 8hr.

Submission Date: 18-09-2021;
Revision Date: 03-05-2022;
Accepted Date: 07-07-2022.

DOI: 10.5530/ijper.56.4.180

Correspondence:
Dr. Ch Taraka Ramarao
Associate Professor,
Department of Pharmaceutical Technology,
Sri Venkateswara College of Pharmacy, Etchrela,
Srikakulam-532410,
Andhra Pradesh, INDIA.
E-mail: tarak.pharm60@gmail.com

INTRODUCTION

Levitiracetam is a widely prescribed antiepileptic medicine that belongs to the BCS Class I drug classification. It has a high solubility and permeability and is used to treat specific types of seizures in adults and children with epilepsy and recent formulations are reported.[1-7] The purpose of this study is to analyze levitiracetam extended-release tablets using HPMC K100, HPMC K15, and Xanthan gum/ Ethyl cellulose. The hydration of HPMC, which forms the gel barrier through which the drug diffuses, is known to limit drug release from the hydrophilic matrix tablet. Concentration increases the diffusion path length for the drug due to the formation of more gel, which delays drug release from the formulation. The recent research found by HPMC polymers are reported.[8-14] The HPMC K100LV or K4M slows the release of themedication by 4 or 8 hr, respectively. The HPMC K100M was preferred for a sustained-released period of more than 12 hr, and the percentage of HPMC K100M in

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RESEARCH ARTICLE

Experimental Design Statistically by Design Expert Software: A Model Poorly Soluble Drug with Dissolution Enhancement and Optimization

Taraka R. Challa*, K. Reshma

Department of Pharmaceutical Technology, Sri Venkateswara College of Pharmacy, Etcherla, Srikakulam, Andhra Pradesh, India

Received: 30th June, 2022; Revised: 24 th August, 2022; Accepted: 1st September, 2022; Available Online: 25th September, 2022

ABSTRACT

The experimental factorial design was performed design expert software to the formulation of rapid orally disintegrating tablets of a poorly soluble model drug to investigate by using superdisintegrant, β-Cyclodextrin (βCD) and surfactant (SLS) on the onset of the anti-hypertensive action of poorly soluble irbesartan. The three independent factors, %, βCD (X1) its concentration (1:1 and 1:5), superdisintegrant (crosspovidone) concentration (2% and 30) (X2) and SLS (0, 2%) (X3) were studied for their main effects on three independent variables on dependent variables, percent dissolved 15 minutes (PD 15%), dissolution efficiency 30 minutes (DE 30), time for 50% dissolved (Q 50%) and disintegration time (DT). Statistical analysis of obtained data and optimization of formulation variables were carried out using Design-Expert trail version software exhibit counter plots and ANOVA studies are significant. The combination maximized desirability over the indicated region to 0.973193. The drug-excipients interaction studies by differential scanning calorimetry (DSC) and fourier transform infrared spectroscopy (FT-IR) indicate no interaction. The accelerated stability study at 40°C and 75% relative humidity (RH) for 6 months and *in-vitro* evaluation against conventional market tablets are significantly identical on dissolution.

Keywords: ANOVA, Dependent variable, Independent variable, Irbesartan.

International Journal of Drug Delivery Technology (2022); DOI: 10.25258/ijddt.12.3.72

How to cite this article: Challa TR, Reshma K. Experimental Design Statistically by Design Expert Software: A Model Poorly Soluble Drug with Dissolution Enhancement and Optimization. International Journal of Drug Delivery Technology. 2022;12(3):1367-1375.

Source of support: Nil.

Conflict of interest: None

INTRODUCTION

Irbesartan is 2-butyl-3-[[4-[2-(2H-tetrazol-5-yl)phenyl] phenyl]methyl]-1,3 diazaspiro[4.4]non-1-en-4-one as shown in Figure 1a, a widely prescribed anti-hypertensive drug belongs to class II under breast conserving surgery (BCS) classification and exhibit low and variable oral bioavailability due to its poor aqueous solubility. In the earlier reported[1] many variations were observed in the dissolution rate and dissolution efficiency of etoricoxib tablets formulated employing selected combinations of binder, disintegrant and β-CD as per 2^3 factorial design (Figure 1b). The oral route is preferred its better patient compliance. Many of the drugs are specific absorption in the gastrointestinal (GI) tract and various factors depending on solubility, stability, ionization various polymers on the drug in different portions of the GI tract influence delayed absorption.[2,3] The optimized formulation with NLT 85% dissolution in 10 minutes could be developed employing 2^3 factorial designs.[4] The tablet dosage form is one of the most preferred formulations because it is economical, accurate dosing, good stability, and administration when compared to other pharmaceutical dosage forms.[5] The surfactants on the dissolution of poorly soluble drugs were compared to identify the most suitable surfactant, sodium lauryl sulfate (SLS) as an anionic surfactant, and polysorbate 80 as a non-ionic surfactant were used successfully developed reported.[6] The incorporation of superdisintegrants in solid dispersion tablets containing a high drug load can strongly enhance the dissolution rate of the highly lipophilic drug fenofibrate, the dissolution rate was more increased when the superdisintegrant was incorporated in the drug-containing solid dispersions than when it was physically

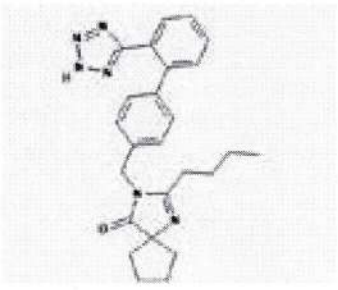

Figure 1a: Chemical structure of irbesartan.

**Author for Correspondence: tarak.pharm60@gmail.com*

Synthesis of Ultra Small Nano-TiO_2 and their Antibacterial Activity under Dark and UV Light.

S.V.N.Pammi[1], V. S. Ksheera Bhavani .A[2], N.L.D. Bhavani[3], R.L. Kalyani[2]*

[1] Department of Basic Sciences and Humanities, GMR Institute of Technology, Rajam, 532127, Andhra Pradesh, India.

[2] Department of Pharmaceutics, Sri Venkateswara College of Pharmacy, Etcherla, Srikakulam-532410, A.P., India

[3] Department of Pharmaceutical Analysis, Shri Vishnu College of Pharmacy, Vishnupur, Bhimavaram-534202, Andhra Pradesh, India.

Corresponding author Email: kalyanipammi85@gmail.com

Abstract

Ultra small and uniform TiO_2 nano particles were synthesized via simple and economical chemical bath deposition method. The synthesized nano-TiO_2 particles were characterized by powder X-ray diffraction (XRD), Scanning Electron Microscopy (SEM), FT-IR spectroscopy (FTIR) and transmission electron microscopy (TEM). XRD and TEM analysis reveals spherical TiO_2 nanoparticles exhibits anatase phase with the average size range of 6-8 nm. Further antibacterial activity of the synthesized TiO_2 nanoparticles were tested against human pathogenic microorganisms including bacterial and fungi under dark and UV light conditions. From the results of the assessment of antibacterial activity of TiO_2 exhibited promising antibacterial agents. In addition nano TiO_2 can be preferable to use in Ointments and Bandages for skin infections.

Keywords: Titanium Oxide, Chemical bath deposition, antimicrobial activity, human pathogens.
DOINumber:10.14704/nq.2022.20.10.NQ55601 NeuroQuantology2022;20(10):6028-6035

1. Introduction

Ultra-small nano materials with average size of less than 10 nm provides the bridge between single atomic size to larger size nano materials, not only in terms of quantum confinement and dimension, but also address the issues of physicochemical properties. [1] Further, ultra-small nanoparticles can be promising materials for nano-medical application due to their unique properties [2]. Among various metal and metal oxide nano particles,titanium dioxide is considered as versatile material for various kinds of industrial applications such as catalysis, photo catalysis for pollutant elimination, photovoltaics, sensors, self-cleaning glass, electric devices, food additives, pharmaceuticals, and cosmetic-products, and paints. [3-6] Especially, Titanium dioxides has been extensively studied and remained as one of the most important candidates used as antibacterium, pollutant purification and solar energy conversion due to its nontoxicity, strong optical absorption, low cost, and high chemical stability [3-6]. Recently, nano-sized TiO_2 was also reported on photo killing of bacteria, tumor cells and viruses have been reported under UV irradiation [7, 8]. There are very few reports on the antibacterial activity

STATISTICALLY OPTIMIZATION AND FORMULATION DEVELOPMENT OF BROMOFENAC SODIUM OPHTHALMIC DRUG DELIVERY

Ch. Taraka Ramarao and Gunta. Preethi

Received: May 01, 2021; Revised: June 24, 2021; Accepted: September 19, 2021

Abstract

The purpose of this work was to develop and optimise the Bromofenac sodium temperature sensitive ocular in-situ gel using a 3^2 complete factorial design. Two factors were evaluated at three levels each, and experimental trials were carried out using various combinations and central point values. As independent variables, the concentrations of gelling agent (X_1) and viscosity enhancer (X_2) were chosen. To improve the response data, dependant factors such as gelling capacity (Y_1), viscosity (Y_2), and 100 percent drug release (Y_3) were used. The Design Expert software was used to do analysis of variance (ANOVA), 3D surface plots, counter plots, optimization, and desirability. The comparative investigations used a commercially available medication (Megabrom) with a better formulation (F5). All of the formulations were clear, transparent, and yellow. When compared to the ocular pH of 7.4, the pH of the formulations ranges from 7.01 to 7.34, which is an acceptable range. All of the formulations had a gelation temperature of 37-43.5°C, and the drug content ranged from 95.13 to 98.55 percent. The pseudo plastic behaviour is observed in all formulations (shear thinning systems). The improved recipe had a higher desirability concern (1), indicating that it was a good formulation. The model's predictability and validity were demonstrated when the experimental values matched the expected values.

Keywords: Optimization, Gelling agent, Viscosity, Megabrom, pH

Introduction

Artificial Neural Networks (ANN) is an abstract **Bromofenac** sodium is a non-steroidal anti-inflammatory medicine (NSAID) that is commonly used to treat severe inflammations and disorders of the ocular posterior segment, including retinal and choroidal neurovascular insertion and cystoids macular oedema. It was used 4-5 times a day as prescribed by the doctor after cataract surgery. In the present study ocular in-situ gels are mainly prepared to overcome the problems exhibited by conventional eye drops. Generally only 5% of the installed dose was absorbed remaining was drained out by the tear fluid. The bromfenac sodium is being delivered more effectively using chondroitin sulphate-chitosan nanoparticles, a new innovative nanocarrier (Abdullah *et al.*, 2016), develop a sustained release microspheric in-situ gel for bromofenac sodium (BNa) to be administered via the ocular route (Xiaoyan *et al.*, 2014), Investigate the toxicity of commercial non-steroid anti-inflammatory drug (NSAID) eye solutions

*Department of Pharmaceutical Technology Sri Venkateswara College of Pharmacy, Etchrela, Srikakulam, Andhra Pradesh- 532410, INDIA E-mail: tarak.pharm60@gmail.com**

* *Corresponding Author*

ISSN 0974-3618 (Print)
0974-360X (Online)

www.rjptonline.org

RESEARCH ARTICLE

In- vitro Design and Formulation of Levitiracetam Extended Release Tablets

Ch. Taraka Ramarao*, Somireddy. Madhuri
Department of Pharmaceutical Technology, Sri Venkateswara College of Pharmacy,
Etcherla, Srikakulam, Andhra Pradesh, India – 532410.
*Corresponding Author E-mail: **tarak.pharm60@gmail.com**

ABSTRACT:
The objective of the present study is to evaluate the extended release tablets of levitiracetam by using HPMC K100, HPMC K15 and Xanthan gum/Ethyl cellulose effect of the dissolution rate of tablets. Tablet each containing 60mg of Levetiracetam were prepared selected combination of factors to evaluate their individual and interaction effects on dissolution rate. The FTIR spectra of pure drug and mixture with various excipients are similar. It's indicates no chemical intration between drug and excipients. The drug release from all the tablets was diffusion control as indicated by the linear Higuchi plots. The release data was analysed Peppas equation the release exponent (n) was found to be in the range 0.76-0.93. Amount all the levetiracetam tablets prepared formulation F2 (fa) formulated employing HPMC K100, 60mg, HMPC K15, 25mg , Xanthane gum 25mg. In the all cases formulations F1, F3, F4, F5, F8 Indicates non fickain diffusion and F2, F6, F7 Indicates super case II transport as release mechanism. The formulation F2 (Fa) was released 100% drug release in a 8 hrs. It is fulfil specifications for extended release tablets. The results of ANOVA of Ko values indicated that the individual and combined effect of the 3 factors is significant ($P< 0.05$).

KEYWORDS: Extended release. HPMC K100, HPMC K15, Ethyl cellulose and direct compression.

INTRODUCTION:
Levitiracetam widely prescribed antiepileptic drug belong to BCS Class I drug with high solubility and high permeability characteristics widely prescribed for certain types of seizures in adults and children with epilepsy belongs to category of anticonvulsant. The various research reported levetiracetam, because of the physical peculiarities of the nasal canal, the intranasal route has the ability to carry into the brain, a gastro retentive patch of levetiracetam was constructed, with the concentrations of Hydroxy Propyl Methyl Cellulose, Carbopol 934P, and Xanthan gum as independent variables., evaluate the superiority of semi-solid extrusion 3D printing technology in the production of levetiracetam tablets with a high drug loading (96 percent w/w), Various ion-exchange resins, such as Amberlite IRP69 and Duolite AP143, have been used to try to disguise the harsh taste of levetiracetam reported[1-6].

Received on 12.11.2020 Modified on 15.09.2021
Accepted on 14.03.2022 © RJPT All right reserved
Research J. Pharm. and Tech. 2022; 15(8):3681-3684.
DOI: 10.52711/0974-360X.2022.00617

HPMC has been used for a variety of research purposes, including controlled release, sustained release and floating[7-10]. The objective of the present study is to evaluate the extended release tablets of levitiracetam by using HPMC K100, HPMC K15 and Xanthan gum/Ethyl cellulose effect of the dissolution rate of tablets. The study is conducted as per 2^3 factorial designs to evaluate the individual main effects and combined effects of the three factors involved. Simple experiments in which each factor is studied at a time, give the effect of the factor studied but number of the combined or interaction effects of two or more factors involved. To evaluate the individual as well as combined effects of two or more factors, the experiments are to be designed as factorial experiment. In the present study, a 2^3 factorial design was used in the formulation of tablets. Three factors, each at two levels, were investigated for their individual and combined effects[11-14]. The three factors in the study are HPMC K100 (factor A), HPMC K15 (factor B), and Xanthan gum/Ethyl cellulose (factor C). To evaluate the individual and combined effects of the factors involved 2^3 factorial designs needs the following eight selected combinations of the factors (treatments).

Health Biotechnology and Biopharma (2022), 6(3): 33-56

Original Research Article

Formulation development of Ezetimibe by using Soluplus and Co- Processed Acacia: tragacanth with Design Expert

Ch. Taraka Ramarao *, Jami. Ravali
Department of Pharmaceutical Technology, Sri Venkateswara College of Pharmacy, Etcherla, Srikakulam, India

***Corresponding author:** Taraka Ramarao, Department of Pharmaceutical Technology, Sri Venkateswara College of Pharmacy, Etcherla, Srikakulam, India. E- mail: tarak.pharm60@gmail.com*
DOI: 10.22034/HBB.2022.22

Received: July 9, 2022; **Accepted:** August 16, 2022

ABSTRACT

Ezetimibe is an antihyperlipidemic drug that lowers cholesterol levels. The purpose of this study was to compare different amounts of solid dispersions and formulations using various carriers in order to improve the dissolution. The Design Expert software was used to perform Analysis of Variance (ANOVA), 3D surface plots, counter plots, optimization, and desirability for a two-level factorial. Sun pharma laboratories limited market product, Ezentia, was compared to the optimised formulation, F6. We compared amount of released that was considerably increased using the solid dispersion method. The dissolving characteristics of the improved formulation, F6, and the market tablet were found to be similar, with f1 and f2 values of 11.71 and 99.89. When the experimental data matched the expected values, the model predictability and validity were shown.

***Keywords*:** Design Expert, Ezetimibe, formulation

INTRODUCTION

The ezetimibe is a class II biopharmaceutical classification system medication with low solubility and high permeability. It is widely prescribed an antihyperlipidemic medication that aids in cholesterol reduction. The ezetimibe's recent research formulations reported that *in-vitro* and *in-vivo* evaluation of solid lipid nanoparticles [1], improve the solubility and dissolution of two fixed dose combination formulations [2]. The water-soluble carriers have showed promise as a technique of improving bioavailability for

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Shape Controlled Synthesis of Cu_2Se Nanostructures and Their Effect on the Performance of Photocatalytic Dye Degradation of Nitrobenzene under Visible Light Illumination

S.V.N.Pammi[1*], G. Thirumala Rao[1], M. Ravichandra[2], R. L. Kalyani[3]
[1]Department of Basic Sciences and Humanities, GMR Institute of Technology, Rajam, 532127, Andhra Pradesh, India.
[2]Department of Chemistry, Indian Institute of Technology Patna, Bihta 801106, Bihar, India.
[3]Department of Pharmaceutics,Sri Venkateswara College of Pharmacy, Etcherla, Srikakulam-532410, A.P., India.
Email: sreepammi@gmail.com

Abstract

Cu_2Se nanostructure have been synthesized by hydrothermal method using different hydroxide solutions to control the morphology. The bare NaOH and mixed NaOH + KOH solutions resulted Cu_2Se nanoplates and Cu_2Se nanowires respectively. The synthesized Cu_2Se nanostructures have been characterized by XRD and SEM. The XRD patterns reveal the pure cubic phase of Cu_2Se. SEM micrographs exhibited nanoplate and nanowire like structures for bare and mixed hydroxide solutions respectively. Photocatalytic performance of Cu_2Se nanowire is observed to be higher the Cu_2Se nanoplates under visible light irradiation over nitrobenzene.

DOINumber:10.14704/nq.2022.20.8.NQ44895 **NeuroQuantology 2022; 20(8): 8735-8740**

1. Introduction

As a p-type semiconductors, copper selenides have numerous components viz., CuSe, Cu_2Se and Cu_3Se_2 with different crystal structures, which makes them promising for numerous potential applications including thermo-electric [1], opto-electric [2], gas sensors [3], solar cells [4], photocatalysis [5], photochemical water splitting [6] and hydrogen generation [7]. Among the copper selenides, Cu_2Se has been considered as one of the most investigated materials owing to its unique properties. Recent reports reveal that Cu_2Se nanostructures with different morphologies including nanowires [6], nano-cauliflower [8], nanoplates [9], nanosheets [5, 10], and thin films [11] have been fabricated using various methods.

The recent literature revealed that low cost, high electrical conductivity and environmentally friendly nature of Cu_2Se makes it suitable for various fields of applications

History of Medicine Studies
HMS

ISSN:1300-669
Volume 18 Issue 1 July 2022

Tosars-Cov-2-ACE2 Binding Interference as a Promising New Strategy for Micro-Inhibition of Respiratory Pathogens on Nasal-Oral Epithelium: An Initial On-Screen Study

R.L. Kalyani , B. Padmasri , N.Phani satyavathi , P. Devi

Abstract

Microbes and viruses that infect the upper and lower respiratory systems cause significant morbidity, lost work time, chronic clinical problems, and even death. Unlike any other country, India's high yearly rate of upper and lower respiratory infections need preventative measures in addition to the current treatment options. The near-unchecked high occurrences of SARS-Cov-2 disease, which has killed or injured hundreds of millions of people over the globe (though the exact numbers vary from country to country), have brought the problem of respiratory infections into sharper focus. After an initially unanswered phase of SARS-Cov-2 virus spread with attendant unseen mortalities, a series of unusual vaccines have slowed the lethal progress to a very significant extent. However, in a world where economic disparity dictates vaccine availability and implementation, it is impossible to vaccinate every human subject, which would amount to nearly 8 to 9 bn people.

Furthermore, due to its extremely volatile nucleic acid makeup, the original virus has given rise to a plethora of variations with varying clinical outcomes around the world. In light of this tangled web of limited resources and ineffective application, there is an ongoing need for a preventative strategy that can micro-fix pathogens like SARS-2 on the nasal epithelium in order to block viral [or any pathogen's] entry through targeted receptor gates. Researchers are looking at the current formulation as a potential nasal/oral mucosa interference for all respiratory infections. This short paper summarizes the results of dry-screen experiments investigating protein-protein interaction and the potential interference of the amino acid Lysine. The structural integrity and spatial orientation of phospholipid bilayers exhibited strange and inexplicable behavior in the presence of increased loads of the same essential amino acid -Lysine.

Keywords: Upper and lower respiratory tract pathogens, virus-host interactions, spike protein, ACE2 receptor, spike-ace2 binding interference, receptor binding domain [RBD], severe acute respiratory syndrome coronavirus type 2

Introduction

One of the most serious challenges to healthcare management and delivery systems anywhere, including in the most organized and advanced countries, has been the two-year-old outbreak of the highly contagious and lethal SARS-2 Corona virus and its derivatives, along with their rapid spread across the globe and attendant casualties [1-3]. In March of 2020, the World Health Organization labeled Covid-19 a pandemic because to its rapid spread and high mortality rate. They also warned of a protracted battle against the unpredictable virus and its variants, stressing the immediate need for preventative, protective, and therapeutic medicines and formulations.Protective strategies via variable lines of vaccines, such as mRNA, DNA, and whole virus vaccine, have come into operations with variable, undefined, and unexplained degrees of protection, while therapeutic interventions have been put into practice first on the basis of clinical expressions of severe inflammation, uncontrolled intravascular coagulation, and multiorgan affections and shutdown. Although there has been some variation in the level of protection provided by currently available vaccines, many questions concerning the optimal timing, number, and composition of doses, the optimal use of adjuvants, the stability of protective antibody levels over time (i.e., the memory cell population), the interactions between vaccines, and the responses of immunocompromised and immune-aberrant subjects, among others, remain unanswered and are gradually being addressed on a global scale.These, together with the daunting prospect of efficiently, thoroughly, and comprehensively vaccination 8–9 billion people throughout the world, appear like our largest ever challenge.Due to global economic, social, and educational inequalities, the world's healthcare crisis may never be solved. As we observed during the last two years [which officially began with one Chinese woman in a Chinese city, eventually spreading throughout the whole globe with known lethality], even a single source of viral repository in the future — wherever — will bring maybe just a few of rounds of death and sorrow. Given this context, there will always be a need for an effective preventative method / formulation, despite the fact that vaccines will be enhanced, refined, changed, and made more protective and better treatment agents will keep coming with time. effective preventative tool with little learning curveusage, accessibility, cost, and near-zero environmental impact.harmful consequences; toxicity.

Associate professor[1,2,3,4]
Department of pharmacy Practice, Sri Venkateswara College of pharmacy, Etcherla, Srikakulam.
Department of pharmaceutical Technology, Sri Venkateswara college of pharmacy, Etcherla, Srikakulam.
Email: kalyanipammi85@gmail.com

History of Medicine Studies
HMS

ISSN:1300-669
Volume 18 Issue 2 July 2022

Protective Effect of Withania Somnifera Bleomycin Induced Pulmonary Fibrosis in Experimental Rats

Dr. N.Phani satyavathi , P. Archana , P. Tarana , S.R.T.P. Ramya

Abstract

Pulmonary fibrosis is a progressive lung disease with a high fatality rate. Bleomycin (BLM) is a common chemotherapeutic drug used to treat a wide variety of carcinomas. It has been stated that BLM is one of the most regularly used medications for producing experimental lung fibrosis because of its severe pulmonary toxicity.
Methods: Lung fibrosis was induced in rats by a single administration of bleomycin (on day 0). The lung fibrosis model was validated by comparing treated and control rats for levels of inflammatory cytokines and indicators of oxidative stress. Cytokine and oxidative marker levels were analyzed in the aforementioned rat lung fibrosis model to determine the effects of Withania somnifera.This study looked at whether or not Withania somnifera may reduce lung fibrosis caused by BLM. Intratracheally administered BLM was given for four weeks, with Withania somnifera given orally at 200 and 400 mg/kg. Withania somnifera not only greatly decreased MDA in lung tissue homogenate and increased GSH in the lungs, but it also significantly decreased TGF-1 and IL 13 in BALF and serum.Since the effects of Withania somnifera were similar to those found with conventional therapy, the findings support its use as a therapeutic agent for the management of idiopathic pulmonary fibrosis in rats exposed to bleomycin-induced lung fibrosis.

Keywords: Lung, Biomarkers, Fibrosis, and Withania somnifera

Introduction

Idiopathic pulmonary fibrosis is a fatal lung ailment with an unknown cause [1]. The prevalence of IPF has been increasing [2] according to epidemiological research during the last two to three decades. Despite the fact that the aetiology and pathophysiology of IPF are still unclear [3, 4], two anti-fibrotic medicines, pirfenidone and nintedanib, have recently been discovered to be helpful in slowing disease development and have been licensed as therapies. Due to the absence of defined markers of [5], clinical treatment of IPF remains challenging.

Pulmonary fibrosis is a chronic, ultimately deadly lung disease. It's the end result of a number of lung inflammatory illnesses. Pulmonary fibrosis is characterized by the disappearance of alveoli, the accumulation of myofibroblasts, the alteration of the lung parenchyma, and the deposition of an abnormally high amount of extracellular matrix [6]. Over 5 million individuals throughout the world are affected with pulmonary fibrosis, making it one of the most common interstitial lung conditions [7]. The average survival time for those diagnosed is around 3 years. Bleomycin is one anti-neoplastic drug that has been linked to BLM, or pulmonary fibrosis. Pathogenesis-related factors include cigarette smoking and exposure to mineral dusts or asbestos [8].

Researchers have shown that BLM-induced pulmonary fibrosis in rats and mice may be utilized to study the progression of human pulmonary fibrosis and the impact of various medicines. It is hypothesized that BLM sets off an inflammatory and fibro-proliferative response by producing reactive oxygen species (ROS) that bind to DNA and cause DNA damage. It has also been suggested that BLM contributes to the worsening of tissue damage caused by oxidants by encouraging the breakdown of endogenous antioxidant defenses. [9].

Associate professor[1,2,3,4]
Department of pharmacy Practice, Sri Venkateswara college of pharmacy, Etcherla, Srikakulam.
Department of pharmacology, Sri Venkateswara college of Pharmacy, Etcherla, Srikakulam.

History of Medicine Studies

ISSN:1300-669
Volume 18 Issue 2 Oct 2022

High Absolute Lymphocyte Counts Correlate with a Better Outcome After Eribulin Therapy for Metastatic Breast Cancer in First-Line Chemotherapy Studies

P. Satish, K. Madhavi , K. Vineetha , B. Jyothsna

Abstract

Background: The impact of prior chemotherapy on blood cell counts may necessitate an evaluation of baseline absolute lymphocyte count (ALC) and neutrophil- to-lymphocyte ratio (NLR) in first-line chemotherapy patients, despite their association with improved PFS and OS.

Methods: This retrospective study assessed the outcomes of patients with HER2-negative MBC who participated in two phase 2 studies (BIRICHEN and OMC-BC 03) and underwent first-line eribulin chemotherapy. For the sake of comparison, data from HER2-negative MBC patients treated at Osaka Medical and Pharmaceutical University Hospital between March 2013 and March 2017 who underwent first-line chemotherapy other than eribulin (treatment of physician's choice; TPC) were also studied. The results showed that in the eribulin group, the median overall survival (mOS) was 30.9 months for those with low neutrophil-to-lymphocyte ratios (L-NLR; n = 23) and 15.4 months for those with high NLRs (H-NLR; n = 36) (hazard ratio [HR], 0.52; 95% confidence interval [CI]: 0.27-1.01). Neither ALC nor NLR were linked to longer OS or PFS among TPC patients. The median overall survival (mOS) in the eribulin group was 32.0 months in the H-ALC group and 19.6 months in the L-ALC group after propensity score matching (HR, 0.43; 95% CI: 0.18-0.99), but there were no significant differences between the mOS in the L-NLR and H-NLR groups. As a result, we conclude that ALC is a prognostic predictor for first-line eribulin chemotherapy but not for other drugs.

Keywords: Metastatic breast cancer, Overall survival, Eribulin, Treatmentof physician's choice, Absolute lymphocyte count

Introduction

The EM- BRACE study [1] showed that eribulin improved OS in patients with HER2-negative metastatic breast cancer (MBC) without causing serious non-hematologic side effects. Abso- lute lymphocyte count (ALC), a measure of the immunological response, was shown to be a predictive predictor of OS following eribulin therapy, according to a recent ad hoc analysis of the study [2]. Curiously, in the TPC group, ALC did not serve as a predictive marker [2]. In early-stage breast cancer, the neutrophil-to-lymphocyte ratio (NLR) is an important predictive factor [2, 3]. The NLR is a measure of systemic immunity. Ad hoc analysis of the EMBRACE study demonstrated a correlation between NLR and improved PFS and OS in the eribulin and TPC groups [2]. However, given the experiment aimed at a late-line treatment, the blood cell count must have been affected by prior chemotherapy. Patients undergoing first-line chemotherapy may benefit from a review of their ALC and NLR at baseline due to the potential impact of prior chemotherapy on blood cell counts.

Two phase 2 studies estimating the effectiveness of eribulin as first-line chemotherapy for HER2-negative MBC were done earlier by us in Japan, and the results were remarkable [4, 5]. This study aimed to test the hypothesis that ALC is a prognostic factor for first-line eribulin treatment but not for TPC by comparing the baseline ALC and NLR of patients treated with eribulin in these trials with those of patients treated for TPC in the same cohort.

Assistant professor[1,2,3,4]
Department of pharmaceutical Analysis,and Department of pharmaceutical Chemistry, Sri Venkateswara college of pharmacy, Etcherla, Srikakulam. Email: satishponnadapharma@gmail.com

A Narrative Review of Global Perspective on Illicit Drug Utilization and Substance Use Disorders

Paila Bhanujirao, Saman Salari, Paeizi Behzad, Tayebeh Salari

Department of Pharmacy Practice, Sri Venkateswara College of Pharmacy, Srikakulam, Andhra Pradesh, India

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Abstract

Drug addiction and abuse are major public health issues across the globe that impact millions of people. Substance abuse and dependence seem to have been relatively high among university students and laborers and comparatively low among school students. Drugs used by the person for nonintended reasons, mainly for their psychoactive effects termed as drug abuse. Continued use of alcohol, illegal drugs, or prescription or over-the-counter medications harms health, employment, family, and law. When it comes to illicit substance usage, possession, and trafficking, every nation has its unique set of laws. The frequency of lifetime drug usage in 2015 was 5%, according to the most current World Drug Report. There is reason to be concerned about the high rates of drug and alcohol addiction among youths because of the substantial problems that have been linked to such use, including higher rates of aggression, suicidal attempts, etc., In this narrative review, we have focused on illicit drugs, substance use, its negative impacts among youths and its prevalence among youths nationally and internationally, and also some prevention strategies to control substance use.

Keywords: Cannabis, drug laws, drug utilization, drugs, illicit drugs, substance use

Introduction

Addiction to drugs, whether legal or illegal, is a serious social health issue that affects millions of individuals throughout the world. The societal costs of drug addiction include those to society's health (including the expenses of drug prevention and treatment, medical care, and hospitals), safety, the environment, and workers' productivity.[1] More than half of the evidence submitted to a crime laboratory is related to drugs, and the laboratory's drug department is often the largest in terms of space, forensic scientists, equipment, and case submissions. This situation has persisted well for over half a century. The government has been fighting the drug problem for nearly a century now on many fronts, including helping other countries crack down on drug production and cultivation, intercepting drug shipments from other countries, cracking down on drug production and sales within the countries, and implementing youth and adult drug abuse prevention programs. Unfortunately, the effectiveness of these procedures has been inadequate over time, and in fact, only a small proportion of international drug shipments are captured at borders. The misuse of several drug classes is now greater than ever in the United States, where drug usage has not decreased. Even Indian Justice Department officials have recently acknowledged that the alleged "war on drugs" has mostly failed and needs to be scaled down.[2]

Drugs and the laws

The Opium Act of 1857, which went into effect to control the cultivation of opium poppy and the manufacture of opium, was one of the former major Acts that the Government of India consolidated to exercise strict control over narcotic drugs and psychotropic substances (NDPS) in India as specified by the United Nations conventions. The import and export of opium and poppy heads were controlled by the Indian government.[3] The Opium Act was passed by colonial India in the hopes of lowering opium usage. According to the new law, only Chinese and Indian opium consumers are allowed to buy opium, and Burmese opium users are categorically forbidden from doing so. Shanghai and Tientsin serve as refineries for most of the illicit

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Website: www.amhsjournal.org

DOI: 10.4103/amhs.amhs_258_22

Address for correspondence: Dr. Paila Bhanujirao, 6-396, 10th Line, NTR Colony, Tekkali, Srikakulam, Andhra Pradesh, India. E-mail: drbhanuji@gmail.com

Submitted: 02-Nov-2022 **Revised:** 23-Nov-2022
Accepted: 30-Nov-2022 **Published:** 23-Dec-2022

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How to cite this article: Bhanujirao P, Salari S, Behzad P, Salari T. A narrative review of global perspective on illicit drug utilization and substance use disorders. Arch Med Health Sci 2022;10:266-73.

Indo-Am. J. Pharm & Bio. Sc., 2021 *ISSN 2347-2251 www.iajpb.com*

Indo-American Journal of Pharma and Bio Sciences

Vol. 19, Issuse 1, Jan 2021

Hepatoprotective Effects of Dawa-Ul-Kurkum, a Unani Polyherbal Preparation and the Possible Mechanisms in Experimental Model of Ethanol Induced Liver Damage in Rats

P. Banujirao , L. Renuka , .M. Urmila , R. Sailaja
Assistant professor[1,2,3.4]

Abstract Objective: Necrosis, elevated oxidative stress indicators such the Nitrates and Nitrites (NOx) test, Malondialdehyde levels, decreased glutathione (GSH) levels depletion, and elevated liver markers are all symptoms of hepatotoxicity. Methods: Hepatic derangement and an increase in several liver indicators were induced in rats by daily dosing with ethanol, simulating the effects of ethanol poisoning in humans. The effectiveness of various pharmaceutical interventions was evaluated using several indicators of liver damage. In addition, hepatic necrosis, fatty alterations, and hydropic degeneration were seen during histological analysis. A comparison of the hepatoprotective benefits of Dawa-ul-Kurkum and Hydro-alcoholic extract therapy with those of conventional medicine treatment showed similar outcomes for both. Higher levels of Malondialdehyde and Nitrates and Nitrites (NOx) test were found in alcoholic liver injury, but reduced glutathione (GSH) levels were found to be lower. Dawa-ul-Kurkum and Hydro-alcoholic therapies both reduced oxidative stress, although to varying degrees. The results show that Dawa-Ul-Kurkum therapy and its extract were effective in lowering hepatotoxic damage indicators in rats exposed to ethanol.

Keywords: Histopathology, hepatotoxicity, ethanol, and the Dawa-Ul-Kurkum

Introduction: The liver plays a crucial role in the body by aiding in digestion, storing nutrients, secreting hormones, and eliminating harmful substances. Hepatotoxicity may develop from excessive alcohol use over time, endangering the liver's regular functioning. The ethanol metabolism produces toxic metabolites that induce oxidative stress and hepatotoxicity [1]. The ingestion of alcohol, a psychoactive substance, has been related to several health problems [2]. One of the primary mechanisms of ethanol-induced hepatotoxicity is oxidative stress. Ethanol is metabolized by alcohol dehydrogenase into acetaldehyde, which is subsequently oxidized by acetaldehyde dehydrogenase into acetate [3-6]. The enzyme cytochrome P450 (CYP2E1) is responsible for converting excess ethanol to acetaldehyde, which has been linked to the generation of reactive oxygen species (ROS) [7-9]. A rise in reactive oxygen species (ROS) and a decline in antioxidant defenses leads to oxidative stress. Recent studies [10, 12] reveal that oxidative stress caused by ethanol is a major contributor to the onset and progression of alcoholic liver disease.

Department of pharmacy Practice, Sri Venkateswara college
Of pharmacy, Etcherla, Srikakulam. Email:drbanuji@gmail.com

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RESEARCH JOURNAL OF PHARMACY AND TECHNOLOGY
Year : 2021, Volume : 14, Issue : 1
First page : (195) Last page : (201)
Print ISSN : 0974-3618. Online ISSN : 0974-360X.
Article DOI : 10.5958/0974-360X.2021.00034.2 (http://dx.doi.org/10.5958/0974-360X.2021.00034.2)

Enhancement of solubility and effect of granulation methods on drug release in sustained release matrix tablets of a poorly soluble drug

Bhavani A.V.S. Ksheera*, Usha A. Lakshmi[2], Rani E. Radha[2], Murty A. Vyasa[3]
[1]Department of Pharmaceutics, Sri Venkateswara College of Pharmacy, Etcherla, Srikakulam, Andhra Pradesh, India
[2]Department of Pharmaceutics, Maharajah's College of Pharmacy, Vizianagaram, Andhra Pradesh, India.
[3]Department of Pharmaceutical Sciences, Univesity of Tasmania, Hobart, Australia.
*Corresponding Author E-mail: andhavarapu.bhavani@gmail.com (mailto:andhavarapu.bhavani@gmail.com?cc=gbehal@indianjournals.com)

Online published on 22 April, 2021.

Abstract

Domperidone, a BCS Class II drug chosen as a model drug which is highly permeable and poorly soluble, mainly used in the treatment of Emesis. It has a strong affinity for D2 receptors, chemically related to Haloperidol, but pharmacologically related to metaclopramide. Sustained release tablet of Domperidone are preferred because of prolonged drug release in order to reduce the frequency of dosing. In the present study, it was decided to design controlled release formulation of Domperidone with pH dependei release profile so as to minimize/prevent initial drug release in the stomach in order to reduce the possible gastro-irritant and ulcerogenic effects of the drug The study was carried out using release retarding polymers like HPMC (hydrophilic matrix polymer), Eudragit (polyacrylate polymers) and natural polymers like guar gum and xanthan gum were used. An ideal matrix formulation prepared using different polymer and diluent concentrations. The formulation were prepared using various compression techniques like wet granulation technique and direct compression techniques in order to release their contents in a sustained manner over a certain period of time. As Domperidone is class II drug having low solubility and more permeability and, the solubility of Domperidon was initially enhanced by preparing solid dispersions using solvent evaporation method by using drug and polymer (β-cyclodextrin) i three different ratios i.e. 1: 0.75, 1: 1, 1: 1.5 and the solid dispersion mixture containing drug and polymer in the ratio 1: 1.5 showed 97% drug release in one hour was optimized as the best mixture. In the present work drug and polymer mixture in the ratio 1: 1.5 was further formulated into tablets by incorporating natural and synthetic gums by using different granulating techniques like direct compression and wet granulation in three different concentrations. Formulation (F3) containing drug and Xanthan gum in the ratio 1 1 prepared by wet granulation technique could sustain the drug release over a period of 12h and hence considering all the post compression parameters it was optimised as the better formulation. FTIR, DSC, X-Ray Diffraction, SEM studies were performed for optimised solid dispersion mixture and also the optimised formulation.

To

Keywords

Solubility, Solid Dispersions, Matrix tablets, Direct Compression, Wet granulation.

To

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Indo Global Journal of Pharmaceutical Sciences, 2021; 11(1): 70-75

INDO GLOBAL JOURNAL OF PHARMACEUTICAL SCIENCES
ISSN 2249- 1023

Novel Approach for Producing Pharmaceuticals in Layer by Layer Fashion: Additive Manufacturing

Lakshmi Usha Ayalasomayajula*[1], Kishore Pathivada [1], Radha Rani Earle [1], A.V.S. Ksheera Bhavani [2]

[1] *Department of Pharmaceutics, Maharajah's College of Pharmacy, Phool Baugh, Vizianagaram, AP, India -535002*

[2] *Department of Pharmaceutics, Sri Venkateswara College Of Pharmacy, Etcherla, Srikakulam, AP, India -535002*

Address for Correspondence: Lakshmi Usha Ayalasomayajula, alakshmiusha@gmail.com

Received: 28.03.2020
Accepted: 18.08.2020
Published: 30.03.2021
Keywords
3D printing, Additive manufacturing, Unit operations, Computer aided design.

ABSTRACT: A novel approach for producing pharmaceuticals from digital designs, in a layer-by-layer fashion is 3D printing. It has been acclaimed as a disruptive technology having the potential to make a paradigm shift in the conventional manufacturing of pharmaceuticals products which involves various unit operations like milling, mixing, granulation, drying and compression. It results in final products of different qualities. The quality of the product is influenced by loading of the drug, release of the drug, stability of the drug and stability of pharmaceutical dosage form. FDA approved 3D printed drug is creating a novel era in pharmaceutical manufacturing. To overcome some of the challenges associated with conventional pharmaceutical unit operations, 3D printing is gaining more attention in the manufacture of pharmaceuticals in the future. 3D printing is capable of overcoming the difficulties relating to the drug delivery of peptides, potent drugs, water-soluble drugs, and the release of multi-drugs. On the other hand we can prepare patient specific or patient tailored medications on patient demand thus making safe administration of drug without any side effects or adverse drug effects. Nevertheless,certain limitations are there in terms of regulatory aspects hindering the launch of 3DP products into the market. © 2020 iGlobal Research and Publishing Foundation. All rights reserved.

Cite this article as: Ayalasomayajula, L.U.; Pathivada, K.; Earle, R.R.; Bhavani, A.V.S.K. Novel Approach for Producing Pharmaceuticals in Layer by Layer Fashion: Additive Manufacturing. Indo Global J. Pharm. Sci., 2021; 11(1): 70-75. **DOI**: http://doi.org/10.35652/IGJPS.2021.111010 .

INTRODUCTION

3D printing (3DP) is a computer-aided design with unique technology of proto-typing layer-by-layer, fabricating 3D objects in the form of digital designs to achieve unmatched suppleness, time conservation and extraordinary manufacturing capability of pharmaceutical dosage forms. It works by depositing, binding and polymerization through layering until the desired object is completed, thereby, applying a brilliant combination of chemistry, robotics and optics principles. 3D printing is also termed as Additive manufacturing (AM) or Solids of free-form (SFF). [1]

In personalized pharmacotherapy pharmacists can fabricate and dispense the personalized dosage instantly to the patients. Currently, the focus is to develop a patient-specific or tailored drug dosing system rather than using the conventional dosage forms, because an individualized dosage form will diminish all potential adverse effects. At present, dose modifications in solid drug delivery is achieved by dispensing multiple low dose tablets or by cutting up the larger sized tablets into smaller portions. Reportedly, over 3000 compounding pharmacies in the United States, dispensed more than 30 million prescriptions annually to provide customized drugs for specific patients. [2]

Although a number of advancements in drug delivery systems and formulations are being discovered, the oral route is still preferred, due to its simplicity and convenience. The advancement of 3D printing technology in the field of pharmaceuticals has brought about a drastic change in the manufacturing process and expected to be used as a large-scale industry in the future. The innovation of 3DP technology recently bequeathedvery first 3D printed orodispersible tablet SPRITAM®(Levetiracetam) by Aprecia Pharmaceuticals and was approved by the US Food and Drug Administration (FDA) in 2015. This drug was indicated as an additional therapy for three prevalent types of seizures that were

Indo-Am. J. Pharm & Bio. Sc., 2021 *ISSN 2347-2251 www.iajpb.com*

Indo-American Journal of Pharma and Bio Sciences

Vol. 20, Issuse 2, May 2021

Pharmacokinetics of panaxynol in mice

P. Archana , N. Rajeswari , D.Prasanth , Ch. Shankaranarayana

Abstract

Our research aims to decipher the panaxynol (PA) pharmacokinetic characteristics and gain insight into the drug's use and dosing in non-human primate models. Liver microsomes from both mice and humans were treated with 5 M of PA for in vitro testing. With the exception of the untreated control, the enzyme reaction was triggered by the addition of nicotinamide adenine dinucleotide phosphate. Concentrations were determined using liquid chromatography tandem mass spectrometry (LC- MS/MS) analysis. PA was injected intravenously (IV) or orally (PO) into CD-1 mice for in vivo experiments. Using LC-MS/MS, the PA levels in plasma and tissue were determined. Non-compartmental analysis was used to determine pharmacokinetic parameters. Using a linear trapezoidal model, we determined the area under the concentration versus time curve. The half-lives of PA in mouse and human liver microsomes are 21.4 and 48.1 minutes, respectively, when studied in vitro. PA has a moderate bioavailability of 50.4% in vivo, with a half-life of 1.5 hr after IV-injection and 5.9 hr after PO administration. Evidence from mice suggestsup to 300 mg/kg orally causes death. Colon tissue concentrations of PA peaked at 486 ng/g 2 hours post-treatment. The minimal toxicity and favorable pharmacokinetics of PA suggest that it is well tolerated by mice.

Keywords: Panaxynol; Falcarinol; Pharmacokinetics; Ginseng; Mice; Half-life; Bioavailability

Abbrevations: AG- American Ginseng; DSS- Dextran Sulfate Sodium; HAG- Hexane fraction of American Ginseng; PA- Panaxynol; PK- Pharmacokinetic; LC- MS/MS- Liquid Chromatography-Mass Spectrometry; IV- intravenous; PO- oral administration

1. Introduction

Native Americans have used ginseng for medicinal purposes for over a millennium. Ginseng is part of the Araliaceae family in the genus *Panax*. One of the most common types of ginseng is *P. quinquefolius* (American ginseng [AG]) [1, 2]. Ginseng has been shown to be a chemopreventive agent in the stomach, liver, pharynx, pancreatic, and colon cancers [3, 4]. It can also improve mental performance and prevent detrimental endpoints that are associated with inflammation and diseases such as diabetes, influenza, and cardiovascular disease [5].Our lab has shown that AG is able to prevent colitis in mice[6, 7]. Since AG is a slurry of many compounds, we set out to determine which particular compound within AG is responsible for the suppression of colitis and prevention of colon cancer. To that end, bioassay-guided fractionation was used to delineate the active component of AG against colitis. We discovered that the hexane fraction of AG (HAG) is particularly potent at suppressing the induction of inducible nitric oxide synthetase *in vitro* and inflammation *in vivo*. Further, we were also able to show that HAG suppresses colitis associated colon cancer in azoxymethane/dextran sulfate sodium (DSS) mouse model [8]. Through preparative, reverse-phase high-performance liquid chromatography and ultraviolet/diode array detection, we have been able to further sub-fractionate HAG and identify an abundant molecule with exceptional potency against inflammatory endpoints. This molecule, called panaxynol (PA; also known as falcarinol), is a polyacetylene that is found in many plants such as carrots, celery, and parsnips [9, 10]. Originally, PA was discovered first by Takahashi *et al.* in *Panaxy ginseng C. A. Meyer* (Asian ginseng) and, independently, by Bohlmann *et al.* in *Falcaria vulgaris* [11, 12]. Furthermore, it has been shown to have anti-cancerous properties [13, 14]. However, research is lacking regarding the response of the body to PA. Finding out the half-life, bioavailability, toxicity, and other pharmacokinetic (PK) properties would help us understand how the body may interact with PA. Therefore, this paper focuses on exploring the PK properties of PA in amouse model.

Assistant professor[1,2,3,4]
Department of Pharmacology, Sri Venkateswara college of Pharmacy, Etcherla, Srikakulam. Email:archana.palavalasa@gmail.com

2.Materials and Methods

2.1Microsome metabolism assay

Research Article

Development and Characterization of Gastroretentive Floating Tablets of Venlafaxine Hydrochloride by Thermoplastic Granulation Technique

Ayalasomayajula Lakshmi Usha[1*], Earle Radha Rani[1], Akondi Vyasa Murthy[1], Andhavarapu Venkata Srinivasa Ksheera Bhavani[2].

1. Department of Pharmaceutics, Maharajah's College of Pharmacy, Phool Baugh, Vizianagaram, AP, India -535002
2. Department of Pharmaceutical Technology, Sri Venkateswara College of Pharmacy, Etcherla, Srikakulam, AP, India

ARTICLE INFO

Date of submission: 6-05-2021
Date of Revision: 12-06-2021
Date of acceptance: 16-08-2021

Key Words:
Gastro retentive, anti-depressant, melt granulation, buoyancy.

ABSTRACT

Gastro retentive dosage forms (GRDFs) is the most feasible approach for achieving a prolonged and predictable drug delivery profile in the gastrointestinal tract. They control the gastric residence time of the drug. The aim of the present study is to formulate, develop and characterize gastroretentive floating tablet of an antidepressant drug Venlafaxine HCl. Venlafaxine HCl is a BCS class I drug having high solubility and permeability. The main objective of the study was to retain the drug in the gastric environment to prolong the drug release time. Twelve formulations were prepared by varying ratios of hydrophobic retardants such as carnauba wax, white paraffin wax, compritol ATO 888 and cetyl alcohol in combination with hydrophilic polymer HPMC K15M. The FTIR and DSC indicated compatibility between the drug and polymers used. The tablets were prepared by hot melt or Thermoplastic granulation method and were evaluated for various parameters such as tablet hardness, weight variation, friability, floating time and *in vitro* drug release profile. Formulation S6 with hydrophobic polymer cetyl alcohol and hydrophilic polymer HPMC K15M in the ratio of 1:3 was the optimized formulation. The optimized formulation showed sustained release of drug for a period of 12 h.

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***Corresponding author:**
Lakshmi Usha Ayalasomayajula
Department of Pharmaceutics,
Maharajah's College of Pharmacy, Phool Baugh, Vizianagaram, AP, India -535002
Email: alakshmiusha@gmail.com

IJPSR (2022), Volume 13, Issue 10 **(Research Article)**

INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES AND RESEARCH

Received on 21 March 2021; received in revised form, 22 May 2021; accepted, 02 June 2021; published 30 September 2021

FORMULATION AND EVALUATION OF ORAL ANTI-DIABETIC IN-SITU GEL SYSTEM OF PIOGLITAZONE

B. Padmasri [*1] and R. Nagaraju [2]

Department of Pharmaceutical Technology [1], Sri Venkateswara College of Pharmacy, Etherla, Srikakulam - 532410, Andhra Pradesh, India.
Department of Pharmaceutics [2], Institute of Pharmaceutical Technology, Sri Padmavathi Mahila Viswa Vidylayam, Tirupati - 517502, Andhra Pradesh, India.

Keywords:

Pioglitazone, Diabetes mellitus, *In-situ* gels, Sodium alginate, Guar gum, Xanthan gum, Carbopol-934

Correspondence to Author:
B. Padmasri

Assistant Professor, Department of Pharmaceutical Technology, Sri Venkateswara College of Pharmacy, Etherla, Srikakulam - 532410, Andhra Pradesh, India.

E-mail: padmasripharma@gmail.com

ABSTRACT: Pioglitazone is an oral anti-diabetic agent used in treating class – II diabetes mellitus. $T_{1/2}$of pioglitazone was 3-6 hrs and is eliminated rapidly. Hence sustained release is needed to prolong its duration of action and to increase its oral bioavailability. The main aim of the study was formulation and evaluation of *an in-situ* gel system of Pioglitazone to increase its bioavailability as a convenient dosage form. Method of Ion-sensitive *in-situ* gelation was used in this study. Total 15 formulations were prepared with Guar gum, Xanthan gum, and Carbopol-934 in various combinations and assessed for physical appearance, pH, viscosity, *in-vitro* gelling capacity, drug content, and *in-vitro* drug release. FTIR, DSC for Pioglitazone, excipients used and optimized formulation were conducted. *In-vivo* drug kinetic studies were conducted for optimized formulation. Formulations showed an optimum viscosity allowing ease of administration and swallowing. All formulations have shown pH between 6.9-7.3, floating lag time was 2-3sec and floated for >12 hrs. The x-ray image studies are also confirming the same thing. *In- vitro* drug release studies reporting that F15 showing drug release of 99.52% over a 12 hrs period. FTIR studies revealed no interaction between drugs and excipients used. The results of In-vivo kinetic studies are approving the better performance of the optimized formulation. In conclusion, the optimized formulation F15 showed maximum drug retardation for above 12 h. Hence it is concluding that the main objective of the study to increase its bioavailability as a convenient dosage form in the treatment of diabetes mellitus had been achieved.

INTRODUCTION: Controlled drug delivery system (CDDS) currently forefront position in drug delivery compare to the developed systems; it consists of various technical approaches to help in individual care.

QUICK RESPONSE CODE

DOI: 10.13040/IJPSR.0975-8232.12(10).5595-03

This article can be accessed online on www.ijpsr.com

DOI link: http://dx.doi.org/10.13040/IJPSR.0975-8232.12(10).5595-03

The strategy of this system having bountiful favorable circumstances than existing conventional types, it involves improved efficiency, diminished toxic effect, and improved consumer conformity in addition ease.

In controlled drug delivery system, systemically or locally, the drug delivers at a predetermined rate for a predefined period. The oral controlled release system entails drug delivery at knowable and consistent kinetics used for predetermined time intervals throughout the gastrointestinal (GI) tract [1].

Int. J. Pharm. Investigation, 2020;10(1):59-63 Original Article

Cross-Linked Chitosan Based Stomach Specific Mucoadhesive Microspheres Loaded with Amoxicillin: Preparation and *ex vivo* Characterization

Radha Rani Earle[1,*], Vanthala Vijaya Bharathi[1], Ayalasomayajula Lakshmi Usha[1], Andhavarapu Venkata Srinivasa Ksheera Bhavani[2]
[1]Department of Pharmaceutical Technology, Maharajah's College of Pharmacy, Vizianagaram, Andhra Pradesh, INDIA.
[2]Department of Pharmaceutical Technology, Sri Venkateswara College of Pharmacy, Srikakulam, Andhra Pradesh, INDIA.

ABSTRACT

Objectives: This research was aimed to evaluate a novel approach for preparation of mucoadhesive microspheres which can reside in the gastrointestinal tract for an extended time period. The microspheres contained amoxicillin, an anti-bacterial agent useful for the eradication of *Helicobacter pylori*. **Methods:** Ten different formulations were prepared by chemical cross-linking technique using gluteraldehyde as a cross linking agent and chitosan as mucoadhesive polymer. Natural release retardant polymers like guar gum, gum ghatti and xanthan gum were employed. All the microspheres were characterized for morphology, particle size, drug entrapment efficiency, swelling index, bioadhesion to mucosal tissue and *in vitro* drug dissolution and anti-bacterial activity against *E. coli*. **Results:** The FTIR and DSC data indicated that there were no interactions between the drug and polymers used. All the microspheres exhibited good flow properties. The microspheres had a spherical shape with rough surface. The microspheres showed a good mucoadhesivity and also anti-bacterial activity. The release of the drug was prolonged to 12h when incorporated into mucoadhesive microspheres. **Conclusion:** Data obtained in this study concluded that mucoadhesive microspheres of amoxicillin can be used to effectively clear *H. pylori* from the gastrointestinal tract due to prolonged residence time resulting from mucoadhesion. In this study drug release was diffusion controlled and followed zero order kinetics.

Key words: Glutaraldehyde, *Helicobacter pylori*, Zone of inhibition, Chick ileum, Mucoadhesion.

Correspondence

Prof. Radha Rani Earle
Assistant Professor, Department of Pharmaceutical Technology, Maharajah's College of Pharmacy, Vizianagaram, Andhra Pradesh, INDIA.
Phone no: +91-9963803008
Email: radhaearle@yahoo.com

DOI: 10.5530/ijpi.2020.1.11

INTRODUCTION

Mucoadhesion is an emerging concept which is used widely in most of the novel drug delivery systems via mucosal membrane of buccal, nasal, digestive tract, etc when administered through various routes.[1] The mucoadhesive microspheres are used in sustained drug delivery with improved bioavailability and targeting efficacy due to their potential in localizing optimized drug delivery by retaining the formulation in contact with its site of absorption.[2] The properties of mucoadhesive microspheres like their force of mucoadhesion, drug release pattern, surface characteristics and biodegradability are determined by the nature of the polymers used in their formulation.[3]

With the availability of variety of natural polymers, the manufacturers today have achieved a tremendous success in developing the most promising therapeutic systems i.e., drug delivery systems, that provide an effective therapy for prolonged time periods.[4] Natural polymers are less expensive and are associated with minimum toxic effects when compared to synthetic release retardants.[5] Chitosan is a biocompatible and biodegradable cationic polysaccharide which possesses mucoadhesive properties due to its ability to form strong interaction with the surface of mucosa.[6]

Amoxicillin is a semi-synthetic, broad spectrum antibiotic for oral use. Chemically it is α-amino hydroxyl benzyl penicillin.[7] Since decades it has been used for the standard treatment of gastric *Helicobacter pylori* eradication which is believed to be the major micro-organism responsible for the cause of gastric or peptic ulcers. Hence its eradication by enhancing the residence time of antibiotic in the stomach is a prerequisite for the treatment of gastric or peptic ulcer.[8]

The objective of this study was to formulate and evaluate *in vitro* and *ex vivo* performances of mucoadhesive amoxicillin microspheres for the potential use in the treatment of gastric and duodenal ulcers, which are associated with *H. pylori* using various natural release retardants. The physicochemical properties were examined using FTIR, DSC and XRD studies. The adhesion of microspheres to mucosal tissue (chick ilem) has been investigated. The antibacterial activity of the drug loaded microspheres was evaluated against a strain of *E. coli*.

MATERIALS AND METHODS

Materials

Amoxicillin, chitosan, guar gum, xanthan gum and ghatti gum were obtained from Yarrow Chem Products, Mumbai. Acetic acid was purchased from Finar Ltd., Light liquid paraffin, petroleum ether, Span 80; gluteraldehyde were obtained from Lotus enterprises.

Preparation of microspheres by chemical cross-linking technique

Amoxicillin loaded mucoadhesive microspheres were prepared by chemical cross-linking technique using gluteraldehyde as a cross linking agent. 4% chitosan solution (in acetic acid) was prepared and the required quantity of drug was dissolved in it. This solution was added

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International Journal of Applied Pharmaceutics

ISSN- 0975-7058 Vol 12, Issue 6, 2020

Review Article

A COMPREHENSIVE REVIEW ON IN SITU GELS

BUDUMURU PADMASRI[1,2*], RAVOURU NAGARAJU[1], DAMARASINGU PRASANTH[2]

[1]Department of Pharmaceutics, Institute of Pharmaceutical Technology, Sri Padmavathi Mahila Viswavidyalayam, Tirupati, Andhra Pradesh, India, [2]Sri Venkateswara College of Pharmacy, Srikakulam, Andhra Pradesh, India
Email: padmasripharma@gmail.com

Received: 02 Jul 2020, Revised and Accepted: 03 Sep 2020

ABSTRACT

The current review on in situ gelling systems becomes one of the most popular and prominent. It had a tremendous potential advantage of delivery systems due to many benefits like easy to use simple manufacturing; improve both adherence and patient comfort by minimizing the frequency of drug administration by its unique characteristics feature of sol to gel transition. It also provides in situ gelling nanoemulsions, nanosphere, microspheres, and liposomes. The drawbacks associated with conventional systems of both solutions and gels, such as accurate dosing, ease of administration overcome by using in situ gelling systems. This review focused on definitions, types, advantages, disadvantages, polymers used, and suitable characteristics of polymers, including the preparation of in situ gels covered in the introduction. Approaches, applications, and evaluation of in situ gels were explained with examples.

Keywords: Gels, Hydrogels, In situ gel, Polymers, Gelling mechanism

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DOI: http://dx.doi.org/10.22159/ijap.2020v12i6.38918. Journal homepage: https://innovareacademics.in/journals/index.php/ijap

INTRODUCTION

A gel is a soft, stable, or solid-like material which consists of at least two components, one of them being a liquid, present in substantial quantity [1]. Gels are a transitional state of matter containing both liquid and reliable ingredients (semisolids or semi-liquids). Gels combine the cohesive properties of solids and the diffusive transport characteristics of fluids [2]. It consists of a three-dimensional, stable, and secure component network [3]. In gels, the polymer network is formed by the cross-linking of polymer chains either by the formation of covalent (chemical cross-linking) or non-covalent bonds (physical cross-linking). Based on nature, gels are classified into two types (i.e., physical and chemical). Physical gels have weak bonds like hydrogen, electrostatic, and Vander Waal bonds [4]. Due to toxicity concern, there is increasing interest in physically cross-linked gels—chemical gels when arising strong covalent bonds [5].

Hydrogels are the polymeric chains of three-dimensional (3-D) structures. So, they can be easily forms in various sizes and shapes [6]. These hydrogels have an excellent absorbing ability to transition between liquid-gel and itself; it is a type of hydrophilic preparations [7]. Hydro-gels consist of cross-links to serve to accommodate a considerable amount of air, and it retains enormous amounts of water and biological fluids to swell. Hydrogels are also classified into two types (i.e., preformed hydrogels and in situ gels) [8].

Preformed gels or preformed particle gels (PPG) are simple viscous solutions that can't undergo any modification after administration [9]. PPG is superabsorbent cross-linking polymers that can swell up to 200 times its original size and act as a fluid diverting agent to control conformance is a novel process designed to overcome some distinct drawbacks inherent in situ gelation system [10]. To overcome changes in gel composition, degradation, lack of gelation time control, and several weaknesses go with preformed gels. Still, dilution by water and it has a defect in ophthalmic dosage form, including less accurate dose, blurred vision, lacrimation, etc. preformed gels are formed on the surface before it is injecting through the reservoir [11]. Hence, no gelation occurs, and it needs to be considered, including pH, salinity, multivalent ions, hydrogen sulfide, temperature, and shear rate [10].

In situ gels are the solutions or suspensions that undergo gelation after reaching the particular site due to contact with body fluids or physicochemical changes such as pH, temperature, ionic concentration, UV radiation, presence of specific molecules, or ions, external triggers, etc. [12]. In situ gel produces a constant plasma drug profile in the body by extending the release of a drug, so it is attached and absorbed in gel form and is known to prolong the life of the drug in the mucosa [13]. The drug delivery systems having the properties, as mentioned earlier, of sol to gel transition can be widely used for sustained delivery vehicle preparation of bioactive molecules [14]. In situ gels, potentially used for oral, buccal, subcutaneous, transdermal, intraperitoneal, ocular, nasal, rectal, vaginal, and parenteral routes [15]. From a manufacturing point of view, less complicated and thus lowers the investment and manufacturing cost [16]. In the discovery phase, the gel formulations are used to enhance the local and systemic exposure of potential lead compounds, which is ideal for establishing animal models for various conditions quickly and cost-effective [17]. Despite the massive diversity of gels, a particular class of gels, namely smart polymer gels, are in the focus of pharmaceutical research during the last decades [18]. These intelligent polymers change their physicochemical properties in response to an altered environment. In recent advances, in situ gels have made it possible to exploit the changes in physiological uniqueness [19]. Comprehensive research has been carried in designing of in situ gels, emerged as one of the best novel drug delivery systems (NDDS) [20]. In this review, they mainly focussed on introduction, advantages, disadvantages, suitable polymer characteristics, approaches, applications, evaluation, and marketing products of in situ gels. It also focused on some reported studies as well as recent advancements of in situ gels.

The intention of writing this review article to describes every aspect of in situ gels, which near the readers a specific feature and might contribute to research and development.

Advantages

- To decrease the wastage of drug [21]
- To ease of administration [22]
- It administered to unconscious and old patients [23]
- It helps to extended or prolonged release of drugs [24]
- It allows more patient comfort and compliance [25]
- Due to the low dose, there will be no drug accumulation and minimize the drug toxicity [26]
- It offers more bio-availability [27]
- By using natural polymers, provides biocompatibility and biodegradation [28].
- By using synthetic polymers usually well defined that can be modified to yield tolerable degradability and functionality [29]

IN VITRO AND *IN VIVO* PHARMACOKINETIC EVALUATION OF VALSARTAN TABLETS: OPTIMIZATION BY FACTORIAL DESIGN 2^3

Ch. Tarakaramarao[a]*, K . P. R. Chowdary[b] and P. Rajeswara Rao[c]

(Received 23 January 2019) (Accepted 29 March 2019)

ABSTRACT

Valsartan, a widely prescribed anti hypertensive drug, belongs to class II under BCS classification and needs enhancement in the dissolution rate in its formulation development. The objective of the present study was optimization of Valsartan tablet formulation with NLT 85% dissolution in 10 min employing βCD, Crospovidone and SLS by 2^3 factorial design. The optimized valsartan tablets developed were evaluated for *in vitro* dissolution and *in vivo* pharmacokinetics. Eight valsartan tablet formulations employing selected combinations of the three factors i.e., βCD, Crospovidone and SLS as per 2^3 factorial design were formulated, prepared by direct compression method and evaluated by *in vitro* and *in vivo* methods. Valsartan tablet formulations F_b and F_{bc} disintegrated rapidly within 45 sec and gave very rapid dissolution of valsartan, 100% in 10 min. Higher levels of βCD and lower levels of Crospovidone gave low dissolution rates of valsartan tablets. The increasing order of dissolution rate (K_1) observed with various formulations was $F_{b=} F_{bc} > F_{ab} > F_{abc} > F_a > F_{ac} > F_1 > F_c$. The polynomial equation describing the relationship between the response i.e. percent drug dissolved in 10 min (Y) and the levels of β CD ($X_{1)}$, Crospovidone (X_2) and SLS (X_3) based on the observed results is $Y = 60.05 + 5.34 (X_1) + 33.88 (X_2) - 8.95 (X_1 X_2) - 3.18 (X_3) - 2.38 (X_1 X_3) + 2.80 (X_2 X_3) + 1.95 (X_1 X_2 X_3)$. Based on the above polynomial equation, the optimized valsartan tablet formulation with NLT 85% dissolution in 10 min (Fopt1) could be formulated employing βCD at 1:3 ratio of drug: β CD, Crospovidone at 26.31% of drug content , and SLS at 1% of drug content. The optimized valsartan tablet formulation (Fopt1) gave 85.86 % dissolution in 10 min, fulfilling the target dissolution set. In the pharmacokinetic evaluation, the biological half – life (t ½) was found to be 5.06 h and 4.66 h, respectively, following the administration of optimized valsartan tablets formulated (Fopt2) and market product. With both the two products tested valsartan was absorbed rapidly and peak concentration is achieved in 1 h. The absorption rate constant (K_a) was 2.275 h^{-1} and 1.409 h^{-1} respectively with Fopt2 and Market product. The relative bioavailability (BA) of valsartan from the Fopt2 formulation was 105.7 % when compared to market product (100%).The optimized valsartan tablets formulated employing βCD, Crosspovidone and SLS (Fopt2) are comparable to the market product with regard to *in vivo* performance.

Keywords: Valsartan tablets, Optimization, β-cyclodextrin, Crospovidone, SLS, Factorial Design, Pharmacokinetics

INTRODUCTION

Valsartan, a widely prescribed anti hypertensive drug, belongs to class II under BCS classification and exhibits low and variable oral bioavailability due to its poor aqueous solubility. Because of poor aqueous solubility and dissolution rate, it poses challenging problems in its tablet formulation development. It needs enhancement in the dissolution rate in its formulation development. Several techniques[1] such as micronisation, cyclodextrin-complexation, use of surfactants, solubilizers and super disintegrants, solid dispersion in water soluble and water dispersible carriers, microemulsions and self emulsifying micro and nano disperse systems have been used to enhance the solubility, dissolution rate and bioavailability of poorly soluble BCS class II drugs. Among the various approaches, cyclodextrin complexation[2,3] and use of superdisintegrant[4,5] such as Crospovidone and sodium starch glycolate (Primojel) and surfactants such as sodium lauryl sulphate (SLS) are simple industrially useful approaches for enhancing the dissolution rate of poorly soluble drugs in their formulation development. Complexation with β-cyclodextrin (βCD) and use of

[a]Department of Pharmaceutical Technology, Sri Venkateswara College of Pharmacy, Etcherla, Srikakulam- 532410, India
[b]Chairman, BOS in Pharmacy, JNTUK, Kakinada- 533003, India
[c]AU College of Pharmaceutical Sciences, Andhra University, Visakhapatnam - 530003, India
*For Correspondence: E-mail: tarak.pharm60@gmail.com

ACTA SCIENTIFIC PHARMACEUTICAL SCIENCES (ISSN: 2581-5423)

Volume 4 Issue 8 August 2020

Review Article

Novel COVID-19 Pandemic Scenario: A Review of the Current Literature

Anilkumar V[1]*, Murali Krishna B[2], Sangeeta Kumari L[3] and Kalyani R[2]

[1]*Assistant Professor, Department of Pharmaceutical Technology, GIET School of Pharmacy, Rajahmundry, East Godavari, Andhra Pradesh, India*

[2]*Assistant Professor, Department of Pharmaceutical Technology, Sri Venkateswara College of Pharmacy, Etcherla, Srikakulam, Andhra Pradesh, India*

[3]*Assistant Professor, Department of Pharmaceutical Analysis and Quality Assurance, Raghu College of Pharmacy, Dakamarri, Visakhapatnam, Andhra Pradesh, India*

*Corresponding Author: Anilkumar V, Assistant Professor, Department of Pharmaceutical Technology, GIET School of Pharmacy, Rajahmundry, East Godavari, Andhra Pradesh, India.

DOI: 10.31080/ASPS.2020.04.0561

Received: June 22, 2020

Published: July 09, 2020

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Abstract

The Pandemic which COVID-19 has made on the Globe needs no depiction. The disease caused by SARS-COV-2 presents flu-like symptoms which can be become serious in high-risk individuals. In this review article we provide an overview of the symptoms, treatment, diagnostic tools, drugs usages, vaccine trials options for Novel COVID-19. We carried out a systematic literature search using the main online databases like Google scholar, PUBMED, Medscape daily News by using keywords like COVID-19, corona virus. We included different publications from last six months data which focused clinical features and treatment. We found entry mechanism of virus into the body, Hand hygiene is key factor to prevent contamination, wear gloves in specified situations. The amin symptoms of COVID-19 are cough, fever, fatigue, slight dyspnea etc. RT-PCR, LAMP, ELISA is used as an analytical instrument utilizing Nasal swab, tracheal suction or bronchoalveolar lavage tests. The primary treatment being used to treat the infection are antibiotics, antiviral drugs like chloroquine. Therefore this review article main theme is focusing on many treatments have been proposed, self quarantine, isolation is the main medication that seems, by all accounts to be powerful in decreasing virus rate specifically designed randomized clinical trials are excepted to determine the most appropriate evidence-based treatment methodology more research work to be carried out to provide more reliable and valid effect to control and mange public emergency in both acute and chronic conditions of coronavirus.

Keywords: COVID-19; Pandemic; RT-PCR; LAMP; ELISA; Prevention; SARS-COV-2; Literature; Medscape; Google Scholar

Introduction

The Novel corona virus disease-19 (COVID-19) is a profoundly transmittable and pathogenic viral disease brought about by serious acute respiratory syndrome corona virus-2 (SARS-CoV-2). Genomic examination uncovered that SARS-CoV-2 is photo genetically identified with severe acute respiratory syndrome-like(SARS-like) bat infection, along these lines bats could be the conceivable primary reservoir, Corona represents crown-like spike on the outer surface of the virus. thus, it was named as corona virus. Recently at the end of 2019, Wuhan. An emerging business hub of china experienced an outbreak of a novel corona virus this virus was reported to be a member of the beta group of corona viruses. It shows that the transmission rate of SARS-CoV-2 is higher than SARS-CoV and the reason could be genetic recombination event at S protein in the RBD (Recent Binding Domain) region of SARS-COV-2 may have enhanced its transmission ability [1]. The new COVID-19 has become a worldwide health danger up to 15th June 2020, COVID-19 has caused the deaths more than four lakhs and worldwide effected persons more than seventy lakhs. It shows flu-like symptoms like fever, cough, cold etc. Although serious lung injury has been portrayed at all ages, in some high-risk in old people, the virus is more likely to cause extreme intestinal pneumonia, acute respiratory distress syndrome (ARDS) and resulting multiorgan failure, which are liable for serious acute respiratory failure and death rates, here, we summarized the present available information on the clinical highlights and treatment choice for COVID-19 [2].

History of Medicine Studies
IHMS

ISSN:1300-669
Volume 16 Issue 1 Jan 2020

Edible green solvent for optimized catechins extraction from green tea leaves: Anti-Hypercholesterolemia

K.E.V. Nagoji , D.Prasanth, B.Ramadevi , M. Narendra

Abstract

Green tea's primary health advantages come from its catechin polyphenol content. It is still difficult to extract catechins from green tea (GTE) leaves under ideal circumstances. The industrial sector requires an extraction technology that is both efficient and cost-effective. We postulated that increasing the yield and biological activity of GTE catechin extraction by using certain extraction procedures in the presence of natural polymers and antioxidants would be possible. Separately and in tandem, the benefits of microwave (30-60 seconds irradiation in a standard household microwave) and ultrasonic aided extraction (UAE) were analyzed. Water, ascorbic acid, chitosan/ascorbic acid, carboxymethylcellulose/ascorbic acid, methylcellulose/ascorbic acid, chitosan/methylcellulose/ascorbic acid, methylcellulose, chitosan/acetic acid, and ethanol were among the nine edible green solventcombinations studied. HPLC-UV was used to measure the quantity of catechins extracted from green tea leaves.Extraction yields for catechins were found to be highest when the MAE & UAE approach was used. The best solvent for extracting catechins was found to be chitosan/ascorbic acid. After 3 weeks of once-daily oral treatment in studies with animals given a high-fat diet, GTE significantly decreased total cholesterol and LDL-C. Finally, green tea catechins that were effectively extracted and stabilized were shown to reduce the high fat diet-induced increase in blood cholesterol and LDL-C.

Keywords: hypercholesterolemia, dyslipidemia, green tea catechins, chitosan, edible solvent, and extraction

1. Introduction

Green tea, an aqueous infusion of dried "Camellia Sinensis" leaves, is one of the world's most popular drinks. Asia is where green tea was first developed. Even though the tea plant has a lot of leaves, only the top two leaves and the bud at the end of each young stem are used [1, 2]. You'll find polyphenols like flavonoids (like catechins and tannins) and alkaloids (like caffeine) in green tea, as well as free amino acids, alkaloids, ascorbic acid, saponins, and unsaturated fatty acids. Catechins such as epicatechin (EC), epigallocatechin (EGC), epicatechin gallate (ECG), and epigallocatechin gallate (EGCG) make up a significant portion of green tea's chemical makeup (30% or more) [3]. Green tea's primary catechin, epigallocatechin gallate (EGCG), is an antioxidant with various health advantages [4, 5]. EGCG makes up 9-13% of green tea by weight. Catechins have been linked to a variety of health benefits, including protection against cancer, inflammation, diabetes, infertility, atherosclerosis, ulcers, hypercholesterolemia, human platelet aggregation inhibition, skin wrinkle reduction, and cardiovascular disease prevention [5,6].

Professor,[1] Associate professor[2,3,4]
Department of Pharmacology, Sri Venkateswara college of Pharmacy, Etcherla, Srikakulam.
Department of pharmaceutical Analysis, Sri Venkateswara
College of Pharmacy, Etcherla, Srikakulam. Email:kevnagoji1966@gmail.com

History of Medicine Studies
HMS

ISSN:1300-669
Volume 15 Issue 1 Jan 2019

Determination of Meropenem, Ceftazidime and Piperacillin Levels in Serum and Meropenem in Cerebrospinal Fluid by Liquid Chromatography for Routine Quanti ication

B.Padmasri , P. Banujirao, V. Anil Kumar, R. Kalyani

Abstract

With this in mind, -lactam antibiotics are a frequent target of therapeutic drug monitoring (TDM) in the intensive care unit (ICU) setting. In this work, we developed a rapid and easy-to-use high-performance liquid chromatography (HPLC) assay for the detection of meropenem, ceftazidime, and piperacillin in human blood and meopenem in cerebrospinal fluid (CSF).

Methods: In this procedure, a stationary phase of 5.0 m Atlantis® T3 was employed. The composition of the A mobile phase was 99.4% water and 0.6% formic acid (pH 2.30). Acetonitrile (93.6% m/m), water (6% m/m), and formic acid (0.4%) made up mobile phase B. Meropenem, ceftazidime, and piperacillin were all determined using a gradient elution technique. The wavelengths of 309nm, 258nm, 235nm, and 260nm were employed for UV absorbance detection. An internal standard was added during sample preparation, and acetonitrile/methanol was used to precipitate the proteins.

Results The linearity, specificity, accuracy, and precision of the approach were all studied. Antibiotic compounds and the internal standard were tested for their stability. Meropenem had a retention time of 7.222 minutes and a single run duration of 23 minutes. Quantification of meropenem was performed between 0.1mg/l (the minimum detectable concentration in serum and CSF) and 100mg/l (the maximum detectable concentration in serum and CSF). The mean ratio of meropenem concentrations in the cerebrospinal fluid to those in the blood was 0.129, and this ratio varied widely across individuals. Meropenem, ceftazidime, and piperacillin all passed an external validation using the proposed technique with a score of 0.092.Results show that the established test permits investigation of relationships among administered dose, serum concentration, and CSF concentration of meropenem. Serum from humans may also be tested for ceftazidime and piperacillin. Research investigating how much meropenem makes it into cerebrospinal fluid may be carried out in future with a larger sample size. Serum and cerebrospinal fluid (CSF) substance measurements using the proposed procedure are suggested.

Keywords: Meropenem, Ceftazidime, Piperacillin, Therapeutic drug monitoring, HPLC, validation, human serum, cerebrospinal fluid

Background : Meropenem ((4R,5S,6S)-3-[[(3S,5S)-5-[(Dimethylamino)carbonyl]-3-pyrrolidinyl]thio]-6-[(1R)-1-hydroxyethyl]4-Methyl-7-Oxa-1-Azabicyclo[3.2.0]: Chemical Structure (Scenario 1[1]) In the case of bacteria, hept-2-ene-2-carboxylic acid, a member of the carbapenem family, is effective against a broad range of gram-positive and gram-negative organisms. It is a beta-lactam antibiotic, therefore it penetrates the bacterial cell and prevents the formation of the cell wall [2]. Due to its remarkable stability against beta-lactamases [3, 4], it is used as a last-resort antibiotic in intensive care units. Ventriculitis is a frequent complication of external ventricular drains (EVD) used to treat acute subarachnoid hemorrhage, intraventricular bleedings, and other acute cerebral diseases [5]. Treatment of such nosocomial infections with meropenem is often recommended. Due to the rising prevalence of antimicrobial resistance and the scarcity of new antimicrobials suitable for clinical use, optimizing doses for existing treatment regimens is becoming more important to guarantee maximum therapeutic efficacy [3, 6, 7]. Therapeutic drug monitoring (TDM) is often used to optimize treatment with several antibiotics, especially -lactam antibiotics. TDM may be particularly useful in ICUs for treating critically ill patients, who often overdose or underdose due to altered pharmacokinetics caused by varying degrees of organ failure [8-10]. However, the greatest challenge for critical care physicians is still determining how to access, keep, and control antibiotic concentrations in specific tissues. In cases of

Assistant professor[1,2,3,4]
Department of pharmaceutical Technology, Sri
Venkateswara college of pharmacy, Etcherla, Srikakulam.Email:padmasripharma@gmail.com

Indo-American Journal of Life Sciences and Biotechnology

Vol.6, Issue.1, March 2018

Current and future directions in the prevention and treatment of Malaria

Dr. L. Renuka , A.V.S.Ksheera Bhavani , N. Hemanth kumar , A. Hari Krishna
Assistant professor[1,2,3,4]

Abstract The Plasmodium parasite, which is what causes malaria, is spread by the Anopheles mosquito. The two most frequent human Plasmodium infections are caused by Plasmodium vivax and Plasmodium falciparum, respectively. Infected insects spread the illness by biting humans, and the disease then proceeds to infiltrate and kill human cells at every stage of development. Malaria is responsible for the deaths of millions of people every year, the vast majority of whom are residents of developing nations in Africa and Asia. In order to reduce malaria transmission, it is necessary to take preventative measures, such as controlling vectors, using insecticide-treated mosquito nets, engaging in seasonal malaria chemoprevention, and providing intermittent preventive medication to babies and pregnant women. Vaccines like RTS,S/AS01 and PfSPZ, among many others, are available thanks to the work of the World Health Organization and other researchers. Many anti-malarial medications are now showing signs of resistance, yet treatment standards have not altered in a long time. Symptoms such as fever, difficulty breathing, and a sudden onset of headache are shared by both COVID-19 and malaria, which may lead to incorrect diagnosis. This article summarizes the progress made toward a global decrease in malaria incidence and provides context for upcoming clinical trials.

Keywords: malaria, prevention, treatment, vaccines, plasmodium,resistance

Introduction

Malaria is a devastating illness that affects many people. Roughly 228 million cases were reported in 2018, with 85 percent concentrated in only 19 nations. From 2005-2015, the number of reported cases decreased from 585,000 to 405,000, with the sharpest fall occurring in Africa. Children under the age of five account for over 67% of all deaths globally. There was an increase in the number of cases in Africa, Ghana, and Nigeria in 2018 compared to the previous year. However, over this time span, the number of cases fell in places like India and Uganda. Tabulated in Table 1 [1] are the Nations where indigenous cases have not been reported during the last three years. Because of the risk of anemia and the resulting low birth weight in the infant, malaria is a major health risk for pregnant women [1]. Global occurrences might reach 1 billion by 2030 if the WHO does not continue to push efforts ahead and encourage via its goal. Therefore, malaria is a difficult infectious illness, especially in Africa, because of the difficulties involved in preventing and treating the condition

Department of Pharmaceutical Biotechnology, Sri Venkateswara College of Pharmacy, Etcherla, Srikakulam.
Department of pharmacy Practice, Sri Venkateswara College of pharmacy, Etcherla, Srikakulam. Email:renukalolugu@gmail.com

Indo-Am. J. Pharm & Bio. Sc., 2019 *ISSN 2347-2251 www.iajpb.com*

Indo-American Journal of Pharma and Bio Sciences

Vol. 12, Issue 2, May 2019

Ischemic and Non-Ischemic Heart Disease: A Patient-Specific Approach to Scar Detection Using Cardiac MRI

B.Padmasri[1], P. Banujirao[2] , V. Anil Kumar[3], R. Kalyani[4]

Associate professor[1,2,3,4]

Department of pharmaceutical Technology And pharmacy Practice, Sri Venkateswara College of pharmacy, Etcherla, Srikakulam.

Abstract

The purpose of this research was to examine the use of cardiac magnetic resonance (CMR) feature tracking for scar identification in a population of patients with varying degrees of ischemic and non-ischemic heart disease.

A total of 89 individuals with chronic ischemia and non-ischemic heart disease (IHD+) and 65 patients with ischemic scars exclusively (IHD) had their cardiac magnetic resonance imaging (CMR) studies retrospectively analyzed. In all cases, original cine pictures were processed using specialized software (Segment CMR, Medviso) to extract global (GCS) and segmental (SCS) circumferential strain. Segmental values from GCSmedian percentage plots were associated with corresponding myocardial segments in late gadolinium enhancement (LGE) after patient-specific median GCS (GCSmedian) was calculated.

Overall, the results showed a range of -3.5% to -19.8% in GCS, with a significantly lower average GCS in IHD+ compared to IHD (p 0.05). The percentage of infarcted myocardial segments was 19% in IHD and 16% in IHD+. 6.7% of IHD+ segments also showed evidence of non-ischemic LGE. GCSmedian percentage plots correlated with LGE to reveal that below a cut- off of 39.5% GCSmedian (87.5% sensitivity, 86.3% specificity, AUC 0.907), the presence of ischemic scar tissue in a myocardial segment was very probable.

95% CI 0.875-0.938, $p < 0.05$).

Ischemic scar tissue in the myocardium may be suspected using patient-specific GCSmedian percentage plots computed from native cine pictures, as shown in the conclusion.

Keywords: Cardiac Magnetic Resonance; Feature Tracking; IschemicHeart Disease

List of Abbreviations: AHA- American Heart Association; AUC- Area Under The Curve; CMP- Cardiomyopathy; CMR- Cardiac Magnetic Resonance; GCS- Global Circumferential Strain; GCS_{median}- Patient-Specific Median Global Circumferential Strain; HHD- Hypertensive Heart Disease; ICC- Intraclass Correlation Coefficient; IHD/IHD+- Chronic Ischemic Heart Disease/ Chronic Ischemic Heart Disease and Concomitant Non-Ischemic Heart Disease; LGE- Late Gadolinium Enhancement; LV- Left Ventricle/ Left-Ventricular: LV-EDV- Left Ventricular End-Diastolic Volume; LV-EF- Left Ventricular Ejection Fraction; ROC- Receiver Operating Characteristics;SCS- Segmental Circumferential Strain; SSFP- Steady- State Free Precession; T- Tesla

Introduction

Imaging scar tissue in ischemic heart disease has progressed to the point where late gadolinium enhancement (LGE) on cardiac magnetic resonance (CMR) is a need [1]. Reduced diagnostic capability of CMR scans in patients with ischemic heart disease and contraindications to gadolinium mean that clinically validated native approaches for identification of ischemia scarring remain inadequate. By keeping tabs on previously recorded voxels during the cardiac cycle, CMR feature tracking detects myocardial deformation and gives information on global and segmental strain from regularly collected native cine sequences [2-4]. Reduced tissue deformation characteristics in infarcts compared to strain values of surrounding healthy myocardium led researchers to conclude that segmental circumferential strain has great potential for separating scar tissue from distant myocardium [5-8]. Strain impairment is not exclusive to ischemia damage; other cardiac illnesses, such as cardiomyopathies and non-ischemic heart diseases, may also affect strain values [9]. Furthermore, owing to inter-individual heterogeneity in global strain levels, it is difficult to define universally appropriate criteria for infarcted and remote myocardium in heterogeneous patient groups. This work thus explores a patient-specific method to scar recognition, using a threshold based on median global circumferential strain

SHORT NOTES

DESIGN AND CHARACTERIZATION OF ALFUZOSIN HCL GASTRORETENTIVE FLOATING MATRIX TABLETS EMPLOYING HPMC K 100M

ABSTRACT

The present investigation involves developing gastro retentive drug delivery systems (GFDDS) of alfuzosin HCl using HPMCK100M a is the matrixing agent and floating enhancer. Sodium bicarbonate in the acidic environment reacts with the acid and produces carbon dioxide. The gastro retentive tablets can be formulated to increase the gastric residence time and thereby increase the oral bioavailability. From the drug release study, it was concluded that the AFTB4 formula of HPMC K 100 M matrix tablets gives the controlled release up to 12 hours by showing increased release with floating lag time 24 seconds. Non – Fickian diffusion was the drug release mechanism from the matrix tablets formulated employing HPMC K 100 M. The matrix tablets (AFTB4) formulated employing 40 % HPMC K 100 M are best suited to be used for gastro retentive dosage form of alfuzosin HCl. Finally, it can be concluded that good candidates for the preparation of gastro retentive dosage forms due its gastric stability, gastric absorption and better bioavailability.

INTRODUCTION

The present investigation was carried out to develop GFDDS of alfuzosin HCl with hydroxy propyl methyl cellulose K 100 (HPMC K100)[1-3]. The polymer HPMC K100M in different concentrations was employed due to its floating properties and drug release kinetics[4]. The optimization of formulation development research is exemplified by recent studies for formulation development[7-10].

MATERIALS AND METHODS

Alfuzosin HCl (Ajanta Pharmaceuticals, Mumbai) HPMC K100 M (Orchid health care, Chennai) micro crystalline cellulose (Moly Chemicals) Sodium bicarbonate and (Finar Chemicals Limited, Ahmedabad) were used. All other materials used were of Pharmacopoeial grade.

METHODS

Preparation of tablets

The required quantities of medicament and matrix materials were mixed thoroughly in a glass mortar. The isopropyl alcohol (1.5%) solution was added and mixed thoroughly to form dough mass. The mass was passed through Seive. No. 12 to obtain wet granules. The wet granules were dried at 60°C. The dried granules were passed through Seive. No. 16 and mixed with sodium bicarbonate and lubricated with magnesium stearate (1%) and talc (1%). They were then passed through mesh No. 100 and blended in a closed polyethylene bag. The tablet granules were compressed into tablets.

EVALUATION OF PREPARED TABLETS

Weight Variation

Hardness

The hardness of the matrix tablets prepared was tested using a Monsanto Hardness Tester.

Friability

For each formulation, the friability of tablets was determined using Roche Friabilator[3].

Floating lag time

The in vitro buoyancy was determined by floating lag time as per the method described by Rosa et al[3]. The tablets were placed in a 100-mL glass beaker containing simulated gastric fluid (SGF), pH 1.2, as per USP. The time required for the tablet to rise to the surface and float was determined as floating lag time[1].

Estimation of alfuzosin in tablets

Five tablets were accurately weighed and powdered. Tablet powder equivalent to 10 mg of medicament was taken into 10 mL volumetric flask and 5 ml of 0.1N HCl was added. The mixture was shaken thoroughly for about 3min. The solution was subsequently diluted suitably with simulated gastric fluid of pH 1.2 and assayed for alfuzosin HCl at 244 nm. Four samples of tablet powder were analyzed in each case.

Indo-Am. J. Agric. & Vet. Sci., 2018

ISSN 2321–9602 www.iajavs.com

Indo-American Journal of Agricultural and Veterinary Sciences

VOL .6 ,ISSUSE.2 April , 2018

Analyzing a National Breast Cancer Registry Reveals Age-Related Variation in Lymph Node Metastases and Survival

G. Divya, N. Rajeswari, K. Pavithra, K. Sandeep kumar Reddy
Assistant Professor[1,2,3,4]
Department of Pharmacology, Sri Venkateswara College of pharmacy, Etcherla, Srikakulam.
Department of Pharmaceutical Analysis, Sri Venkateswara College of Pharmacy, Etcherla, Srikakulam.
Email: jayadivya07@gmail.com

Abstract

Background: For several cancers, including those of the breast, young ageat diagnosis is associated with an adverse prognosis. Although this effect isoften attributed to heritable mutations such as BRCA1/2, the relationship between pathologic features, young age of onset, and prognosis for breastcancer remains unclear. In the present study, we highlight links between age-of-onset and lymph node metastasis (LNM) in US women with breastcancer.

Methods: Case listings from Surveillance, Epidemiology, and End Result(SEER) 18-population-based registry data for women with breast cancer, which include information on race, were used. LNM and its associated outcomes were evaluated for a subset of women with receptor subtype information and then compared against a larger, pre-subtype validationset of data from the same registry. Age of diagnosis was a 5-category variable; under 40 years, 40-49 years, 50-59 years, 60-69 years and 70+ years. Univariate and adjusted multivariate survival models were applied to both sets of data.

Results: As determined with adjusted logistic regression models, women under 40 years old at diagnosis had 1.55 times the odds of LNM as women60-69 years of age. The odds of LNM for (HR = hormone receptor) HR+/HER2+, HR-/HER2+, and triple-negative breast cancer subtypes were significantly lower than those for HR+/HER2-. In subtype-stratified adjusted models, age of diagnosis had a consistent trend of decreasing oddsof LNM by age category, most noticeable for HR+ subtypes of luminal Aand B. Univariate 5-year survival by age was worst for women under 40 years, with LNM attributable for 49% of the hazard of death from cancer in adjusted multivariate models.

Conclusions: Lymph node metastasis is age-dependent, yet not all molecular subtypes are clearly affected by this relationship. For <40-yr- old women, LNM is a major cause for shorter survival. When stratifiedby subtype, the strongest associations were in HR+ groups, suggesting a possible hormonal connection between young age of breast cancer onset and LNM.

Keywords: Breast cancer, Nodal metastasis, early age of diagnosis, SEER cancer registry

Background

In 2020, an estimated 276,480 new cases of breast cancer were diagnosedin the United States (https://seer.cancer.gov/statfacts/html/breast.html). For women with breast cancer, the infiltration of tumor cells into surrounding lymph nodes is associated with a poor prognosis.Lymph node metastasis (LNM), a means for the regional and distant spread of tumor cells, has a considerable influence upon treatment options and patient survival. Approximately 60% of all newly diagnosed cases of breast cancer are localized (non-metastatic). However, one third of the patients with localized cancers will eventually develop metastatic disease [1]. Of all new cases of breast cancer, another third have regional LNM at the time of diagnosis [1]. Lymph nodes usually represent the first site of metastasis of breast cancer, and they initiate the process of metastasis of the disease.

Breast cancer is distinctive among highly prevalent cancers in that women with a young age of onset often have a more aggressive form of the disease. Although younger women are eligible for more intensive therapy, they nevertheless have, relative to older patients, worse survival and a higher recurrence rate [2,3]. Although links between molecular/receptor subtypes and disease progression (metastasis in particular) are commonplace

Indo-American Journal of Life Sciences and Biotechnology

Vol.6, Issue.1, March 2018

Antibiotic Resistance Pattern and Biofilm Formation of *Staphylococcus* and *Enterobacteriaceae* Isolates from Clinical Samples of Patients with Urinary Tract and Surgical Site Infections in Kinshasa, Democratic Republic of Congo

A.V.S. Ksheera Bhavani , M.Madhuri , L. Sangeetha kumara, B. Rajesh kumar

Abstract

Community and hospital-acquired illnesses may be caused by either Gram-negative or Gram-positive bacteria. The rise, development, and dissemination of bacterial resistance to antimicrobials are among the world's leading health concerns. Bacteria employ biofilm development as a method of resistance. The purpose of this research was to examine Staphylococcus aureus and Enterobacteriaceae isolates for their antibiotic resistance profile and their capacity to produce biofilms.

Methods: Patients at Hôpital Biamba Marie Mutombo and Saint Joseph Hospital were sampled for urinary tract and surgical site infections, yielding a total of 18 Staphylococcus aureus and 60 Enterobacteriaceae clinical isolates. Disk-diffusion testing was used to identify the antibiotic resistance pattern of the isolates. The capacity of bacterial strains to create and form un biofilm was evaluated using the microtiter plate technique.

Antibiotic and biofilm producer resistance was found to be very common among clinical isolates of S. aureus and Enterobacteriacea. Complete resistance to ampicillin-sulbactam, piperacillin-tazobactam, vancomycin, amoxicillin-clavulanic acid, levofloxacin, and aztreonam was also seen in S. aureus strains. Third-generation cephalosporins, imipenem, and amoxicillin-clavulanic acid were all completely ineffective against strains of E. coli, Enterobacter sp., Citrobacter sp., and Serratia sp. The capacity to create a biofilm was not linked to resistance to antibiotics.

The findings of the current research show that MDR-TB is on the rise, and they recommend setting up a program to track the development of resistance to antibiotics.

Keywords: Staphylococcus aureus, Enterobacteriaceae, Biofilm, and Antibiotic Resistance

Introduction

Since fewer or, in some cases, no effective antimicrobial drugs are available to treat illnesses caused by pathogenic bacteria, the emergence of resistance to numerous antimicrobial agents in these bacteria has become a huge public health problem. 1). Emerging and increasing antibiotic resistance affects both Gram-positive and Gram-negative bacteria [1]. Multidrug-resistant microorganisms have emerged as a global threat to effective illness treatment [2]. The cost-effectiveness of antibiotics with varying degrees of resistance [3, 4] is negatively impacted by the prevalence of infections caused by multidrug-resistant organisms (MDROs), including higher mortality, morbidity, duration of hospital stay, and overall healthcare costs. Methicillin-resistant Staphylococcus aureus (MRSA), resistant gram-negative bacilli (RGNB), and vancomycin-resistant enterococci (VRE) are all examples of multidrug-resistant organisms [1]. Several phenomena, including bacterial impermeability to the drug, bacterial destruction of the antibiotic molecule, an efflux system that can pump antibiotic out of the cytoplasm of bacteria, and genetically associated changes (mutational events, genetic transfer of resistance genes via plasmids, and mutations of target genes), all contribute to the development of antibiotic resistance in bacteria [5]. Extended-spectrum beta-lactamases (ESBL) and carbapenemase enzymes, such as oxacillinase (OXA)-48-like -lactamases, were produced by Enterobacteriaceae,

Assistant professor [1,2,3,4]
Department of Pharmaceutical Analysis, Sri
Venkateswara College of Pharmacy, Etcherla, Srikakulam

IJPSR (2018), Volume 9, Issue 6 **(Research Article)**

INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES AND RESEARCH

Received on 25 August, 2017; received in revised form, 11 January, 2018; accepted, 27 January, 2018; published 01 June, 2018

PHYTOCHEMICAL SCREENING AND BIOLOGICAL STUDIES ON THE LEAVES OF *TINOSPORA CORDIFOLIA*

B. Ramadevi [*1], K. Sita Kumari [2], D. Prashanth[1], A. V. S. Ksheera Bhavani [1] and P. Aswini Lavanya[1]

Sri Venkateswara College of Pharmacy [1], Etcherla, Srikakulam - 532410, Andhra Pradesh, India.
Maharajah's College of Pharmacy [2], Phoolbaugh, Vizianagaram - 535002, Andhra Pradesh, India.

Keywords:

Tinospora cordifolia, Phytochemical Screening, Antihelminthic, Pheritima posthuma

Correspondence to Author:
B. Ramadevi

Assistant Professor,
Sri Venkateswara College of Pharmacy, Etcherla, Srikakulam - 532410, Andhra Pradesh, India.

Email: renu.karri@gmail.com

ABSTRACT: Helminthiasis is also known as worm infection and a endoparasitic disease of humans and other animals in which a part of a body is infected with parasitic worms. *Tinospora cordifolia* is a well known medicinal plant and widely used in folk medicine ayurvedic system. The objective of this work is to carry out phytochemical screening and in vitro anthelmintic activity of methanolic, petroleum ether and ethylene glycol extracts of leaves of *Tinospora cordifolia* (Menispermaceae) against Indian earthworm, Pheretima posthuma. Various concentrations (2.5, 5, 10, 20 mg/ml) of the extracts were tested, which involved determination of time of paralysis and time of death of the worms using Albendazole (10 mg/ml) as standard drug and normal saline as control. The methanolic extract exhibited a maximum anthelmintic activity than the other two extracts. The extract showed anthelmintic activity in dose dependant manner giving shortest time of paralysis (P) and death (D) with 20mg/ml concentration and caused paralysis in 4 min and death in 10 min respectively. The Preliminary phytochemical analysis indicated the presence of various phytoconstituents in the extract of which alkaloids, glycosides, triterpenes and steroids might have contributed for the potent anthelmintic activity. From the above study, it significantly shown the antihelimenthic activity and provides scientific rationale for the traditional use of *Tinospora cordifolia* for Helimenthiasis. The future scope of *Tinospora cordifolia* provides economic, safe and efficacy of antihelminthic drug contributing to the society.

INTRODUCTION: Helminthiasis is a highly prevalent disease worldwide that is caused by species platy helminthes (flat worms) and nematoda (round worms) [1]. Helminthes infections are commonly found in community and being recognized as cause of much acute as well as chronic illness among the various human beings as well as cattle's [2].

QUICK RESPONSE CODE

DOI: 10.13040/IJPSR.0975-8232.9(6).2573-78

Article can be accessed online on: www.ijpsr.com

DOI link: http://dx.doi.org/10.13040/IJPSR.0975-8232.9(6).2573-78

The disease may transmitted by fecal-oral route. According to the WHO, approximately 2 billion people are affected by helminthic infections worldwide [3]. Children are vulnerable to complications like malnutrition [4]. Chemical control of helminthes coupled with improved management has been an important worm control strategy throughout the world [5].

However, the high cost of modern anthelmintics has limited the effective control of these parasites [6]. In some cases widespread intensive use of sometimes low quality anthelmintics has led to development of resistance and hence a reduction in the usefulness of available anthelmintics [7, 8].

WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.074
Volume 7, Issue 9, 522-533. Research Article ISSN 2277– 7105

STUDIES ON ACTINOMYCETE ISOLATES FOR PROBIOTIC ACTIVITY

Srijana Kasturi*[1], A. V. S. Ksheera Bhavani[2], M. Madhuri[3] and B. Ramadevi[4]

[1]Department of Pharmaceutical Biotechnology, Au College of Pharmaceutical sciences.

[2]Department of Pharmaceutical Biotechnology, Sri Venkateswara College of Pharmacy.

[3]Department of Pharmaceutical Analysis and Quality Assurance, Sri Venkateswara College of Pharmacy.

[4]Department of Pharmacognosy, Sri Venkateswara College of Pharmacy.

Article Received on
08 March 2018,
Revised on 29 March 2018,
Accepted on 19 April 2018,
DOI: 10.20959/wjpr20189-11649

***Corresponding Author**
Srijana Kasturi
Department of Pharmaceutical Biotechnology, Au College of Pharmaceutical Sciences.

ABSTRACT

The probiotic concept is having lots of different applications in human and animal health. Probiotics are the living organisms which, when administered in adequate amounts confer a health benefit on host. Probiotic products consist of different enzymes, vitamins, capsules or tablets and some fermented foods contain microorganisms. The beneficial effects produced by probiotics are like lactose intolerance, immune system, traveller's disease, cancer, dysbiosis, cholesterol reduction, etc. The present research work is to study existing actinomycetes isolates for probiotic activity and have the surviving capability at low pH and bile tolerance towards bile salts. Among the existing isolates of VMS 20-30 isolates, VMS-30 was selected based on their antimicrobial activity tested against *Staphylococcus aureus* and *Escherichia coli*. Although in the stomach, pH can be as low as 1.0, in most in vitro assays pH 3.0 has been preferred. Due to the fact that a significant decrease in the viability of strains is often observed at pH 2.0 and below. As the existing actinomycete isolate was tested for their ability to tolerate the low pH, it was observed that there was no change in the growth of the inoculated organism. According to the results VMS-30 strains were resistant to 0.2%, 0.3%, 0.4%, 0.5% bile salt. The isolate was able to grow in bile salt as they survive.

KEYWORDS: Probiotics, Bile tolerance, Acid tolerance, Actinomycetes.

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SUSTAINED RELESAE MATRIX TABLETS OF DICLOFENAC SODIUM EMPLOYING KOLLIDON SR, PEG 6000, LACTOSE MONO HYDRATE AND EUDRAGIT S100 IN COLON TARGET

Ch. Taraka Ramarao*, J. Vijaya ratna and B. Srinivasa Rao

(Received 04 November 2016) (Accepted 21 June 2017)

ABSTRACT

The Matrix Tablets each containing 50 mg of diclofenac sodium are prepared employing kollidonSR by direct compression method. All the tablets were found to be non-disintegrating in acidic (pH1.2) and alkaline (pH 7.4) fluids. As such, the prepared tablets were of good quality with respect to drug content, hardness and friability. As the tablets formulated were non- disintegrating in acidic fluids, they are considered suitable for colon targeting..From the drug release study it may be concluded that the (DK2) E2 formula of diclofenac sodium matrix tablets have given the desired release profile by showing a minimal release during the lag period of 5 hrs and complete release at the end of 12 hrs. The tablets having the optimised formula (DK2)E2, having 25% kollidonSR with 5% of channelling agent (EudragitS100 to that of kollidonSR) showed minimal release of 27.4% in the lag period of 5 hours and 99.3 % of the drug was released y the end of 12hours. The diclofenac sodium matrix tablets formulated by employing kollidonSR and various channelling agents showed non-fickian diffusion mechanism and following zero order kinetics. The optimized formula (DK2) E2 follows Supercase II transport as mechanism for drug release and it follows zero order kinetics. Matrix tablets (DK2) E2 formulated employing 25% kollidonSR and 5% eudragit S100 are best suited to be used for colon targeting of diclofenac sodium.

DRAFT

Keywords: Colon targeted, Floating, PEG, Kollidon SR, Lactose, Diclofenace

INTRODUCTION

Colon targeted drug delivery has the potential to deliver bioactive agents for the treatment of various colonic diseases including inflammatory bowel disease (IBD) and rheumatoid arthritis and can be effectively treated by the local delivery of drugs to the large intestine. The other potential applications of colonic delivery include chronotherapy, prophylaxis of colon cancer and treatment of nicotine addiction[1]. Colon specific drug delivery has gained increased importance not just for the delivery of drug in the treatment associated with the colon, but also as a potential system for the systemic delivery of the therapeutic peptides and proteins. The colon drug delivery requires that the triggering mechanism in the delivery system only respond to the physiological condition particular to the colon. Hence, continuous efforts have been made in designing colon-specific delivery system with improved site specificity and versatile drug release kinetics to accomplish different therapeutic needs. The formulation should be such that when taken orally minimum amount of drug should be release up to 5 hours and the complete release up to 12 hours[2]. Oral delivery of the drug to the colon is very valuable in the treatment of the colon diseases like ulcerative colitis, carcinomas, amoebiasis, inflammatory bowel disease (IBD) and rheumatoid arthritis and can be effectively treated by the local delivery of drugs to the large intestine whereby high local concentration of the drug can be achieved while minimizing the side effects that occurs due to the release of drug in upper GIT (Gastro Intestinal Tract) or systemic absorption.

Diclofenac sodium is frequently used for treating rheumatoid arthritis[3-5]. Rheumatoid arthritis shows peak symptoms in the early morning but diclofenac sodium can't be taken early in the morning as it cause gastric disturbance. A formulation which does not release diclofenac in the stomach but releases it in colon and releases the drug in a slow and controlled manner will very useful in the treatment of rheumatoid arthritis. The objective of the research work to prepare matrix tablets of diclofenac sodium employing kollidonSR for colon specific drug delivery and evaluate the same. The optimized release formulae for the kollidonSR was determined

***For Correspondence:**
Department of Pharmaceutical Technology,
Sri Venkateswara College of Pharmacy,
Etcherla, Srikakulam, Andhra Pradesh - 532 410, India
E-mail: tarak.pharm60@gmail.com