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Novel Drug Delivery Approach: Transdermal Drug Delivery System – A Review

Sharma Kruti*, Bharat Bava Somgiri, Yadav Vikas, Musaratafrin Saiyed
A.R. College of Pharmacy & G.H. Patel Institute of Pharmacy
Vallabh Vidyanagar, Gujarat - 388120
Email: sharmakruti00@gmail.com

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ABSTRACT

The transdermal drug delivery system is a type of controlled drug delivery system that works by delivering a drug through the skin. It has various advantages such as reduced side effects, better patient compliance, and faster termination of drug therapy. The major barrier is stratum corneum that prevents the transdermal permeation of most drugs. It is considered the most limiting barrier for the drug penetration route. Various factors such as age, skin, color and other conditions are also taken into account to determine the delivery of drug from this route. It is divided into various systems, such as a reservoir system, matrix system and micro-reservoir system, which are used for incorporation of the active ingredients into the circulatory system via the skin. TDDS consists polymer matrix, membrane, drug, penetration enhancers, pressure-sensitive adhesives, backing laminates, release liner, etc. These components can be divided into various configurations to form transdermal patches. After preparation of transdermal patches, consistent methodologies are adopted to test the adhesion properties, physicochemical properties, in vitro drug release studies, in vitro skin permeation studies, skin irritation studies and stability studies. According to the duration of therapy, various drugs are commercially available in the form of transdermal patches. In this review, we describe the transdermal delivery methods and their evaluation in each generation. We then comment on their current and future potential in medicine.

Key words: Transdermal drug delivery system, drug penetration enhancers, release liners, resin system.

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Preparation and Evaluation of Bedaquiline Loaded Microspheres by Solvent Evaporation Technique

J. Adlin Jino Nesalin, Manu Kumar M S*
Department of Pharmaceutics, Bharathi College of Pharmacy, Bharathinagar-571422
Maddur Taluk, Mandya District, Karnataka, India
Email: manukumarms671@gmail.com

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ABSTRACT

The Bedaquiline loaded Ethyl cellulose microspheres were prepared by solvent evaporation technique. Microspheres of different core: coat ratio were formulated and evaluated for loading efficiency, particle size, zeta potential, solubility studies, *in vitro* drug release, kinetic studies and stability studies. The prepared microspheres have a particle diameter ranging approximately from 289-578 µm and a zeta potential of the ideal formulation F5 is found to be 1.6 mV. There was a steady increase in the entrapment efficiency on increasing the polymer concentration in the formulations. The *in vitro* release behaviour from all the drug loaded batches were found to follow zero order and provided sustained release over a period of 12 h. No appreciable difference was observed in the drug content of product which were stored at 5˚C and room temperature during 3 months of stability studies. According to the data obtained, this ethyl cellulose- based delivery system opens new and interesting perspectives as drug carriers.

Keywords: Microspheres; Ethyl cellulose; Bedaquiline; solvent evaporation method.

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Nephroprotective Potential of *Mimusops Elengi* Root on Gentamicin Induced Nephrotoxicity Rat Model

Prakash Dabadi[1], Mallappa H. Shalavadi[2], ChandrashekharV. M[2*]
[1]Department of Pharmacology, Bapuji College of Pharmacy, Davangere, Karnataka, India
[2]Department of Pharmacology, Hanagal Shri Kumareshwar College of Pharmacy, B.V.V.S Campus, Bagalkot, Karnataka, India
Email: chandupharm75@gmail.com

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ABSTRACT

Background: Gentamicin is widely used as an antibiotic to treat Gram-negative bacterial infections. There is proof that oxidative stress is involved in gentamicin-induced nephrotoxicity. In Ayurvedic medicine *Mimusops elengi* considered as a "pharmacy in itself". Traditional literature claims that it treats a variety of kidney diseases.

Objective: To discover nephroprotective potential of Hydroalcohol extract of *Mimusops elengi* root (HEME) in exerting a protective influence on gentamicin induced nephrotoxicity.

Material and methods: Animals were treated with gentamicin (100 mg/kg/day i.p) and selenium (2 mg/kg oral), HEME (200 and 400 mg/kg oral) for 8 days. A satellite group was employed to scrutinize the reversibility of nephrotoxic effects after gentamicin discontinuation. At the end of the study, all rats were sacrificed and serum and urine parameters were examined and enzymes were measured in renal tissue along with the histopathological examination of the kidney.

Results: Increase in serum creatinine, BUN, and albumin, lipid peroxidation, reduction in the activity of the antioxidant enzymes, and deterioration of tubules, and arterioles, as exposed by histopathological examination, confirmed the expression of nephrotoxicity initiated due to gentamicin. Simultaneous administration of HEME and gentamicin protected kidneys against nephrotoxic effects of gentamicin as supported by normalization of renal function parameters and betterment of histopathological changes.

Conclusion: Data proposes that HEME diminished oxidative stress associated with renal damage by protective antioxidant enzymes, reducing lipid peroxidation.

Keywords: Gentamicin, *Mimusops elengi*, Oxidative stress, Nephrotoxicity.

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Characterization Studies of Soap Prepared from *Lantana camara*

D. Sivakumar*
Department of Pharmaceutical Chemistry, PSG College of Pharmacy, Coimbatore, Tamilnadu
Email: sivakumard@psgpharma.ac.in

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ABSTRACT

Soap may be defined as a chemical compound resulting from the interaction of fatty acids, oils and salt. It is a cleaning agent made by the chemical action of alkali on fats or fatty acids to yield the sodium or potassium salts of these acids. This study investigated the aqueous extraction of leaves of *Lanata camara* and the production of soaps from the extract. The soaps produced were characterized in terms of color, pH, moisture content, total fatty matter, free acid and alcohol insoluble content.

Methodology: Fresh leaves of *Lanata camara* were shade dried for 48 hours and were sequentially extracted using water and then methanol for 24 hours. Then filtered using a buchner funnel and whattmann filter paper No 54. The obtained extract was heated at 40˚c for evaporation until the volume reaches up to 10ml.

Results: The pH of test soap was found to be 7.3. This shows the presence of low amount of unsaponifiable matter due to mild incomplete alkaline hydrolysis. **Conclusion:** The efficacy and potency of the produced medicated soap using *Lanata camara* aqueous extract was found to be good when compared to the standard medicated soap.

KEYWORDS: *Lanata camara*, Soap, Fatty acids, Foaming agent, Saponification.

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Study on Prescribing Pattern of Antihypertensive Drugs in a Tertiary Care Hospital, Bangalore

Chandrika. C[1], Muthukumar Mani[2*]
[1]Department of Pharmacy Practice, Visveswarapura Institute of Pharmaceutical Sciences, Bangalore
[2]Department of Pharmacy Practice, Faculty of Pharmaceutical Sciences, PES University, Bangalore
E-mail: muthukumar1197@gmail.com

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ABSTRACT

Hypertension in most patients is the result of unknown pathophysiological etiology (essential or primary hypertension). It is impossible to cure this form of hypertension but it can be controlled. A small percentage of patients have a particular cause of their high blood pressure (secondary hypertension). There are many potential side causes that are either concurrent medical conditions or are induced endogenously. Prescription pattern monitoring studies (PPMS) are studies of drug utilization with a focus on prescribing, distributing and administering drugs. Prospective observational study conducted for six months of duration in a tertiary care hospital. A total of 115 hypertensive patients from the general medicine department were included in the study. The relevant data were collected from the case report form and the collected data are documented in the specialized designed patient profile form then analyzed statistically and represented graphically using SPSS software. Out of the total 115 hypertensive patients included in the study, 82 (71%) were male while 33 (28%) were female, and almost 65% are older than 65 years of age. Our findings showed that combination therapy (56.52%) for blood pressure management was preferred over monotherapy (43.48%). Our study results shows that Diabetes Mellitus is the most common comorbid condition seen with Hypertension (37.5%) and the most commonly prescribed class of antihypertensive agent was calcium channel blockers and β-blockers, 54.78% and 40.87% respectively. Calcium channel blockers(amlodipine) was the highly prescribed drug in the monotherapy whereas Angiotensin Receptor Blocker (telmisartan) and β-blocker (metoprolol) was the drug of choice for treatment of hypertensive patients as a combination therapy. Our findings also give insights for the need for more adherence to the guidelines during antihypertensive drug selection and this can be easily achieved by expanding and integrating the clinical pharmacist role in hypertension management.

KEYWORDS: Hypertension, Prescription pattern monitoring studies, Combination Therapy, Mono Therapy, Clinical Pharmacist.

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Invitro Anti-Urolithiatic Activity of Some Plant Extracts

Celestin Baboo R V*, Shijikumar P.S, Sirajudheen M.K, Sherin.A, Fathima Habeeba N
Jamia Salafiya Pharmacy College, Pulikkal, Malappuram, Kerala
E-mail: celestinbaboo@gmail.com

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ABSTRACT

Urolithiasis is one of the common conditions in which the calculi are formed or located in the urinary system. It is a process of stone formation in kidney, bladder, ureter or gallbladder. Since it is a multifactorial disease, its etiology is very complex and highly unpredictable. The stone formed in the urinary system is an aggregation of solute materials present in urine such as calcium oxalate, calcium phosphate and uric acid. A wide range of population depends on the traditional system of medicine. A number of plants are used in the traditional system of medicine to treat many diseases. The remedy from herbal sources offers better protection and decreased relapse, because they promote the repair mechanism in a natural way. Therefore investigation of a new herbal remedy for urolithiasis from Mother Nature is the goal of this study. Plants used for the various ailments were selected for the present study. Alcoholic extract of the selected plant showed good anti-urolithiatic activity when compared to the standard drug cystone.

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Pharmacognostic Evaluation of leaves of *Clausena dentata* (willd.)roem.

[1]Thilagavathi S, [2]Kemila P, [3]Krishnaveni C*

Department of Botany, PSGR Krishnammal College for Women, Coimbatore
Email : krishnaveni@psgrkcw.ac.in

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ABSTRACT

This study presents the detailed organoleptical, macroscopical and anatomical evaluation of leaves of crude drug *Clausena dentata* (Willd.)Roem. belonging to family Rutaceae, an important medicinal plant in Indian system of medicine. The leaves were evaluated using procedure of light, with the help of sense organs. The study was help to identify and establish the authenticity of *Clausena dentata* (Willd.)Roem. The parameters also help to standardize the crude drug and minimize the drug adulteration.

KEYWORDS: *Clausena dentata* (Willd.)Roem., standardization of herbal drugs, organoleptic, macroscopic, anatomical evaluation