NATIONAL CONFERENCE ON NEW DRUG DEVELOPMENTS

DJPS COLLEGE OF PHARMACY

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Formulation and Evaluation of Orodispersible Tablets of Diclofenac Sodium

Dr. Ramesh D. Ingole , Principal, DJPS College of Pharmacy

Abstract:

Diclofenac sodium (DS) a non-steroidal anti-inflammatory drug (NSAIDs) has a bitter taste and is a local stomach irritant. It is used in variety of pain including body pain, tooth ache. Or dispersible tablets have advantages that is bypasses GI tract and hepatic portal systems which will lead to an increase in the bio viability. Diclofenac sodium has a bitter taste which will hinder patient compliance. Thus, the aim of the study was to prepare taste masked drug resin complex (DRC) using ion exchange resin (Indion 234) and prepared DRC was directly compressed to obtain Orodispersible tablets. DRC was evaluated for variables like drug: resin ratio, pH, soaking time, temperature and stirring time on drug loading and taste masking. Orodispersible tablets were prepared by direct compression technique using Camphor as subliming agent to yield porous tablets. A 32 factorial design was implemented for the optimization of the formulation. The concentration of Indion 234 (X1) and concentration of camphor (X2) were selected as independent variables while disintegration time (Y1) and % friability (Y2) as dependent variables. The prepared tablets were evaluated for hardness, friability, disintegration time, wetting time and in vitro drug release. The formulation batch (F7) containing 5.1 mg Indion 234 and 14 mg Camphor exhibited better results with respect to disintegration time, friability and drug release.

MICROSPONGE DRUG DELIVERY SYSTEM FOR TOPICAL DELIVERY

Mr. Pimple R.G., Assistant Professor, DJPS College of Pharmacy

Abstract:

Microsponge Delivery System (MDS) is a unique technology for the controlled release of topical agents and consist of macro porous beads, typically 10-25 microns in a diameter, loadedwith active agent. Microsponges are porous, polymeric microspheres that are mostly used for prolonged topical administration. Microsponges are designed to deliver a pharmaceutically active ingredient efficiently at minimum dose and also to enhance stability, reduce side effects,and modify drug release profiles. When applied to the skin, the microsponge releases its activeingredient on a time mode and also in response to other stimuli (rubbing, pH, etc.). MDS technology is being used currently in cosmetics, over-the-counter (OTC) skin care, sunscreensand prescription products. Conventional preparations have some disadvantages like unpleasantodour, greasiness and skin irritation. These problems are overcome by microsponge delivery system. Microsponge based drug delivery system produces controlled released action. It also produces site specific and target organ action produced. Microsponge (MDS) mainly developed in topical drug delivery as well as oral controlled delivery system. It also used in cosmetic formulations.

Forced degradation and stability indicating studies of drugs

Kabra Pritishchandra Sureshchandraji, Assistant Professor, DJPS College of Pharmacy

Abstract:

Forced degradation is a degradation of new drug substance and drug product at conditions more severe than accelerated conditions. It is required to demonstrate specificity of stability indicating methods and also provides an insight into degradation pathways and degradation products of the drug substance and helps in elucidation of the structure of the degradation products. Forced degradation studies show the chemical behavior of the molecule which in turn helps in the development of formulation and package. In addition, the regulatory guidance is very general and does not explain about the performance of forced degradation studies. Thus, this review discusses the current trends in performance of forced degradation studies by providing a strategy for conducting studies on degradation mechanisms and also describes the analytical methods helpful for development of stability indicating method, degradation products that can be studied to determine the stability of the molecule.

SUBSTITUTED HYDRAZONES: A VERSATILE PHARMACOPHORE

Suryawanshi Milind Balaji, Assistant Professor, DJPS College of Pharmacy

Abstract:

Hydrazone is a class of organic compounds with general structure R1R2C=NNH2. Hydrazone derivatives of carbonyl compounds are synthesized by the action of different hydrazine on ketones or aldehydes. Hydrazones possessing an azometine -NHN=CH- proton has been reported to be substituted with a number of heterocycles such as pyridine, furan, isooxazole, isoindole, thiophene, pyrimidine constituting an important class of compounds for new drug development. Therefore, many researchers have synthesized these compounds as target structures and evaluated their biological activities. Literature studies revealed that hydrazonesand various substituted hydrazones are associated with a broad spectrum of biological activitiessuch as antioxidant, antibacterial, anti-inflammatory, analgesic, antiviral, antifungal, antiplatelet, antitubercular, anticonvulsant, antimicrobial, and anticancer activities etc. Nifuosroxazide, Isoniazid, isocarboxazide, nitrofurazone, furazolidone and nitrofurantoin are some marketed hydrazone derivatives. The present review focuses on the different biological activities possessed by different hydrazones.

Study Quality and Stability of matrix tablet containingDexamethorphan

KanchanS. Jamkar, Assistant Professor, DJPS College of Pharmacy

Abstract:

Dexamethorphan has been used as an expectorant, detoxificator, anti-allergic, and antioxidant., grown in Mongolia by previous study. The objective of the study was to develop prolonged release matrix tablet with hepatoprotective effect and to evaluate their pharmacotechnical qualities and stability.The matrix tablets were prepared by wet granulation method. In order to develop appropriate tablets various excipients such as matrix former, diluents, binder, lubricant and glidiant were added. APIs and matrix former, diluent and binder were mixed properly and were granulated with the 5% solution of PVP K-30 as a binder solution. The wet mass was granulated by wet granulator through the sieve with 2 mm diameter holes and generated wet granules were dried at room temperature. Dry granules were lubricated with talc and magnesium stearate. The matrix tablets were prepared by the compression of the tablet mixture using rotary tablet machine. The quality of the prepared tablets was evaluated according to Mongolian National Pharmacopoeia's methods by criterias such as appearance, average weight, weight variation, hardness, friability, mocrobiological contamination and in-vitro dissolution study. Licozinat matrix tablets contained monoammonium glycyrrhizinate 140 mg; glycine 50 mg; LD-methionin 50 mg in each tablet.Formulations were evaluated and satisfied the quality criteria by Dexaamethasone National Pharmacopoeia methods. The stability of matrix tablet tested by long term method for 12 months and by accelerated method for 6 months. stability testing results by both long term and accelerated method, Licozinat matrix tablet was stable for 12 months. Stability testing of matrix tablet is continuing by long term method.Controlled release "Licozinat" matrix tablets were prepared by wet granulation method. Formulation (F5) containing 20% HPMC K4000 releases in the desired manner and was determined to be the appropriate design. Licozinat matrix tablet was stable for 12 months. Stability testing of matrix tablet is continued by long term method.

Formulation and characterization of Novel nano-gel

Mr. Kiran N. Khodke, Assistant Professor, DJPS College of Pharmacy

Abstract:

Nanoparticles synthesized by combining a hydrogel and a cross-linked hydrophilic polymer. Nanogels are robust nanoparticles that could be used to deliver active drug compounds in controlled drug delivery applications. Nanogels drug delivery system is more effective and safer for both hydrophilic and hydrophobic drugs due to their chemical composition and formulations that are inappropriate for other formulations. Nanogels have enabled enlargement of functionalized nanoparticles, which act as a drug carriers that can be loaded with drugs and other active material to be released in a controlled manner at specific site. This review aims at providing general introduction on nanogels, recent synthesis methodology and their novel application in different fields.

REVIEW ON COUMARIN AND ITS DERIVATIVES

Karpe C.E., Assistant Professor, DJPS College of Pharmacy

Abstract:

Coumarins owe their class name to 'Coumarou', the vernacular name of the tonka bean (*Dipteryxodorata*Willd.,Fabaceae). Coumarin is classified as a member of the benzopyrone family of compounds, all of which consist of a benzene ring joined to a pyrone ring. Various methods are used for the synthesis of coumarin derivatives. Coumarin is used for treatment ofHigh Protein Edema (HPE). Coumarin has been shown to activate cells of immune system andused in treatment of cancer. Coumarins are competitive inhibitors of Vit. K,thus act as anti- coagulant.Coumarine and its derivatives are highly effective against inflammatory response.Both coumarin and itsderivatives have shown promise as potential inhibitors of cellular proliferation in various carcinoma cell lines.

Solubility Enhancement of Low Water Soluble Drug Cefpodoxime

Mr. Hanuman S. Kolse , *Assistant Professor, DJPS College of Pharmacy*

Abstract:

The aim of this present study was to enhance the solubility and bioavailability of cefpodoxime through Complexation with 2 hydroxyl-β-Cyclodextrin.

Cefpodoxime is belonging to BCS class 1V with poor solubility and poor permeability. So it is difficult to formulate this type of dosage form because they show maximum side effects and also have low therapeutic index. So, solid dispersion is one of the most widely used techniques to enhancement the solubility and dissolution of poorly water soluble drugs.

Cefpodoxime is a poorly water soluble antibiotic drug. Cefpodoxime is a hydrophobic molecule that is practically insoluble in aqueous media and exhibits slow intrinsic dissolution rate. It has slow erratic and complete oral administration.

Various different technologies are available for the preparation of solid dispersions like melting method, solvent method,and freeze drying method, spray drying, melt extrusion method, Lyophilisation technique etc. In the Preformulation studies, cefpodoxime was characterised by various physiochemical properties such as UV, FTIR Study, Melting point, Partition coefficient calibration curves and solubility profile. The drug was formulated as solid dispersion with β-Cyclodextrin as a carrier. Different ratios of solid dispersion were prepared 1:1, 1:4, 1:6 by kneading techniques. It was concluded that the solubility of cefpodoxime drug was increase by using solid dispersion method.

Management of Treatment Rersistant Depression

Tengse K.A., *Assistant Professor, DJPS College of Pharmacy*

Abstract:

Treatment Resistant Depression (TRD)is subset of Major Depressive Disorder characterized by an inadequate response to at least two trials of anti-depressant treatment at adequate dose and duration in monotherapy. Critical factors that influence the probability of response to antidepressants include non-adherence, misdiagnosis of disorder failure to recognize a general medical disorder insufficient dose and/or inadequate duration, ongoing alcohol or substance abuse. Several subtypes of depression also respond differentially to various antidepressants. For example, psychotic depressions often do not respond to antidepressant monotherapy. Number of therapeutic options are there for management of TRD. Traditional pharmacological approach includes augmentation by the aid of lithium, triiodothyronine (T3) also second generation antipsychotics may be used. Optimizing, combining and switching classes of antidepressant pharmacotherapy is best suitable option. Psychotherapeutic approaches may be undertaken in combination with somatic or pharmacological treatments. Brain stimulation by electroconvulsive therapies & Repetitive Transcranial Magnetic Stimulation is the established best therapeutic option for TRD. Magnetic seizure therapy (MST) is a powerful technique for the management of TRD. In Deep Brain Stimulation (DBS), a permanent neurosurgical implant is placed in the brain, with a specific target to activate or silence.Vagus nerve stimulation (VNS) is proposed to modulate brain activity via stimulation of the tenth cranial nerve, the vagus nerve. The only registered drug for TRD is the NMDA receptor antagonist, S-ketamine, but add-on therapies with second-generation antipsychotics, certain nutritive, anti-inflammatory and neuroprotective agents seem to be effective.

ACRYLAMIDE-MEDIATED CARDIOTOXICITY AND ITSPROMISING TREATMENTS

Nemane Shraddha Tukaram, Assistant Professor, DJPS College of Pharmacy

Abstract:

Acrylamide is, α, βunsaturated carbonyl derivative, a food borne chemical, belongs to class Type-2 alkenes. It is utilized in industry to synthesize polymers, gels and have various commercial applications. Exposure to humans can be from diet and external sources, a need exists to develop the understanding of its distribution in food and environment. Acrylamide ispresent in food rich in carbohydrates and is derived from heat-induced reaction between the free amino acid (asparagine) and reducing sugar. It is reported that acrylamide exposure has been linked to major organ system toxicity. The possible reasonsforcardiotoxicity of acrylamide is, its high reactivity and ability to bind cell thiols, amine group in proteins, DNA bases, and induces oxidative stress and proinflammatory effects. It is evident that oxidativestress possesses important effect in pathogenesis of CVD (cardiovascular diseases).Given the pervasive environmental and endogenous presence of these potentially toxic compoundsdiscussion of molecular mechanism and possible toxic risk could be important. Various strategies can be adapted for acrylamide toxicity treatments that are, the agronomical approach, technological approach and pharmacological approach.

RECENT ADVANCES IN SUBSTITUTED THIAZOLIDINEDIONES ASANTICANCER AGENTS

Pentewar Ram Shankarao, Assistant Professor, DJPS College of Pharmacy

Abstract:

4-Thiazolidinones are a saturated pharmacophore of thiazole that possesses diversity in the biological activities. 1, 3-Thiazolidin-4-ones are heterocycles that have an atom of sulphur at position 1, a nitrogen at position 3 and a carbonyl group at position 4. Anti-tumour propertiesof 4-thiazolidinones are related to their affinity to anticancer bio targets such as a JNK stimulating phosphates-1 (JSP-1), tumour necrosis factor TNFα, anti-apoptotic bio complex Bcl-XL-BH3, integrin αvβ3, etc. 4-thiazolidinone derivatives with antitumor activity on human lung cell line (H460 and H460/TaxR), colon cell line (HT29), breast cancers cell line (MCF-7 & MDA-MB 231), cervical cell line, leukaemia, renal & prostate cell line have become a promising area of research. 4-Thiazolidinone also have antiviral, anti-fungal,antibacterial, anti-inflammatory, anti-convulsant, anti-diabetic, anti-hyperlipidemic, cardiovascular and anti- tubercular. The compounds such as ralitoline (anti-convulsant), etozoline (anti-hypertensive), pioglitazone (hypoglycemic), and thiazolidomycin (activityagainst streptomyces species) have already been successfully introduced in the market.

UTILIZING EUDRAGITS FOR FORMULATION AND EVALUATION OFCHRONOTHERAPEUTIC DOSAGE FORM

Pulgamwar Gajanand Venkatrao, Assistant Professor, DJPS College of Pharmacy

Abstract:

The objective of the present investigation was to design a chronotherapeutic dosage form containing microspheres of antihypertensive drug. The microspheres of drug were prepared using Eudragit by optimization technique through application of Design Expert® software. Themicro particles were prepared by emulsion solvent evaporation method where the effect of two independent variables drug: polymer ratio and stirring speed on two response variables particlesize and entrapment efficiency was investigated. The prepared formulations were evaluated forin-vitro evaluation study parameters viz. micromeritics, mean particle size, percent yield, entrapment efficiency drug release profile. The optimized microsphere formulation was then incorporated into treated hard gelatin capsule shell. Validation of optimization model and Statistical interpretation of results was done using Analysis of Variance (ANOVA) which indicated that the independent variables had significant effect on response variables. The wholecapsular system was evaluated for lag time and in-vitro drug release. The results indicated thatthe optimized double coated capsule shells showed an extended release of drug from microspheres after a lag time of 4 hrs. Conclusively, the dosage form to be dosed at bed time was successfully prepared that has the potential for effective chronotherapeutic management of hypertension.

Use of flower extract of certain species of Malvacea family as a Compound Indicator

Suryakar Vijaykumar Bapurao, Assistant Professor, DJPS College of Pharmacy

Abstract:

Indicators used in titration show well-marked changes of colour in certain intervals of pH. Most of these indicators are organicd yes and are of synthetic origin. The environmental pollution caused by chemical industries in the synthesis of organicdyes had made scientist in developing country to enter in to an era, in which plant products serveas an alternative to synthetic products. Herbs are non-polluting renewable supplies of chipper products for the world growing population,natural pigments in plants are highly coloured substances and may show color changes with variation of pH.

Formulation and Evaluation of Anti-inflammatory transdermal patch

Lad Susihlkumar Udhavrao, Assistant Professor, DJPS College of Pharmacy

Abstract:

Transdermal delivery is a painless method of delivering drugs systemically by applying a drug formulation onto intact and healthy skin. The objective for formulation of anti-inflammatory transdermal patch is to convert the herbal extract into a novel dosage form, to formulate and characterized transdermal patch, to provide direct entry of extract into blood circulation, to provide a synergistic effect of lemongrass oil and to check the antimicrobial activity of the formed formulation. The development of TDDS technology is widely recognized as the development of a mass delivery methodology, which makes it the preferred drug injection modality for transdermal delivery across skin types, while preventing first-pass metabolism and other sensitivities associated with various alternative drug administration routes. In TDDSs, drugs can be delivered through the skin to the systemic circulation. Drugs are generally reliably and safely delivered through TDDS and are safe and stable from biochemical modifications until they reach the target tissue. TDDS is non-invasive, non-allergenic, and has a set duration and dose delivery method, which allows for uniform distribution of drugs at prescribed and controlled rates. Many new and old formulations are in the process of improving the bioavailability of low-absorption drugs via easy routes of administration that allow large doses to be administered over a long period of time. Therefore, the TDDS technology is growing rapidly in the pharmaceutical field and has succeeded in capturing key value in the market for biomedical applications as a formulation system that can improve drug delivery through topical routes.

Antibacterial activity of selected Thymus vulgaris medicinal plant in vitro

Dahiphale Vijay Bagirao, Assistant Professor, DJPS College of Pharmacy

Abstract:

Background Antimicrobial resistance has become a serious problem of public health. It creates a constant need for either new antimicrobial compounds or inhibitors of mechanisms that underlie antibiotic resistance. Thymus valgaris is one of the well-known South-East Asia countries where natural substances are widely used for treatment of many diseases, especially for infectious diseases. As such, the study of antibacterial activity of plants traditionally used by Thymus valgaris traditional healers to treat infectious diseases is important. This study aimed to screen the antimicrobial activity of 138 extracts from 67 plants that are traditionally used by Thymus valgaris traditional healers. Methods The plants were collected in eight provinces and cities of Thymus valgaris. The extraction was performed using ethanol:water (50/ 50 v/v) to obtain the majorities of the compounds present in plants. The antibacterial activities of plants extracts were first tested against reference strains, Staphylococcus aureus (ATCC 6553; cocci; Gram positive bacteria) and Pseudomonas aeruginosa (ATCC 9027; rod; Gram negative bacteria), and then against clinical strains using micro-dilution and macro-dilution tests, respectively. Results A total of 138 extracts isolated from 78 species of plants were tested. Most of the extracts were very active against S. aureus but less active against P. aeruginosa. Only 5 extracts derived from 5 plants were highly active against both standard and isolated strain of S. aureus. Three plant extracts were highly active against standard strain of P. aeruginosa but weakly active against its isolated strain.

Preclinical studies of Euphorbia hirta against DEN-2 dengue infection

Choure Hanumant Vachistha, Assistant Professor, DJPS College of Pharmacy

Abstract:

Dengue is still a major problem in Malaysia and causing high mortality. There is no specific treatment for dengue and one of the strategy is to study the effect of herbal medication on dengue. The aim is to review the results of the series of preclinical studies that has been conducted for Euphorbia hirta in treating dengue fever. Methods Several preclinical studies were conducted namely the phytochemical, efficacy and toxicity studies. Phytochemistry studies were conducted on water extract of Euphorbia hirta with chromatography and spectrometry analysis. The in vitro plaque assay and the in vivo studies on AG129 mice were conducted with non-mouse adapted Malaysian dengue virus type 2 (DEN-2) infection. The mouse model of DENV-infection that closely mimicked the human disease was established and used to study the immunomodulatory activity involving specific cytokines, the endothelial cell biology in dengue infection and the effect of dosing on the day of infection. The genotoxicity and general toxicology studies were also conducted. in a clinical trial. The phytochemistry studies allowed confirmation of the herb identity and consistency of the chemical composition for efficacy and toxicity studies. Plaque assay and the in vivo studies have confirmed that the extract of Euphorbia hirta do not kill the dengue virus. The extract affected the immunomodulatory system and the endothelial cells of the blood vessels. These provide clues to the control of the cytokine 'storm' and the vascular leakage that is the characteristic of dengue haemorrhagic fever. A previous study has confirmed that Euphorbia hirta juice increases the platelet by inducing the platelet production in the bone marrow. The results of the toxicity studies were also favourable. Conclusions The preclinical studies has provided evidence that Euphorbia hirta extract worked on different pathogenesis of dengue fever and can be further studied in a clinical trial.

Needle free injection technology A novel drug delivery

Hange Dipak Dagdu, Assistant Professor, DJPS College of Pharmacy

Abstract:

Needle free injection technology is an extremely broad concept which include a wide range of drug delivery systems that drive drugs in the skin using any of the forces as Lorentz, Shock waves, pressure by gas or electrophoresis which propels the drug through the skin, virtually nullifying the use of hypodermic needle. This technology is not only touted to be beneficial for the pharma industry but developing world too find it highly useful in mass immunization programmes, bypassing the chances of needle stick injuries and avoiding other complications including those arising due to multiple use of single needle. The NFIT devices can be classified based on their working, type of load, mechanism of drug delivery and site of delivery. To administer a stable, safe and an effective dose through NFIT, the sterility, self life and viscosity of drug are the main components which should be taken care of. Technically superior needle-free injection systems are able to administer highly viscous drug products which cannot be administered by traditional needle and syringe systems, further adding to the usefulness of the technology. NFIT devices can be manufactured in a variety of ways; however, the widely employed procedure to manufacture it is by injection moulding technique. There are many variants of this technology which are being marketed, such as Bioject® ZetaJetTM, Vitajet 3, Tev-Tropin® and so on. Larger investment has been made in developing this technology with several devices already being available in the market post FDA clearance and a great market worldwide

FORMULATION AND EVALUATION OF CALENDULA AND POMELO PEEL ANTI-ACNE GEL

Alure Bhalchandra Shivajirao , Assistant Professor, DJPS College of Pharmacy

Abstract:

The herbal ball has been used as a Thai traditional medicine for relieving many diseases including acne. However, the application process of the herbal ball in practice is complicated and time consuming. The objective of this work was to utilize an herbal ball extract to formulate a gel to reach a more favorable use of the herbal ball for acne treatment. An herbal ball consisting of the Benchalokawichian remedy and the stem bark powder of was prepared. The obtained herbal ball was steamed and squeezed to obtain the extract. Gel formulations containing the herbal ball extract at concentrations of 0.1, 1 and 5% w/w were prepared based on a carbomer gel. The herbal ball extract had antioxidant and anti activities and minimum bactericidal concentration The 5% w/w gel formulation had antimicrobial activity against P. acnes, showing an inhibition zone value of This indicates that the developed gel formulation has potential for acne treatment. In comparison to the traditional method of herbal ball usage, the application of herbal ball extract in the form of gel should be more convenient to useCalendula Calendula officinalis, Garden marigold, Pot marigoldThe flower petals of the calendula plant (Calendula officinalis), or pot marigold, have been used formedicinal purposes since at least the 12th century Calendula is native to Mediterranean countries butsnow grown as an ornamental plant throughout the world. Calendula has high amounts of flavonoids, plant-based antioxidants that protect cells from being damaged by unstable molecules called free radicals Calendula appears to fight inflammation, viruses,and bacteria. cuts, as well as the minor infections they cause. Calendula also has been shown to help.

HPLC Method Development and Validation

Mr. Krushna A. Zagade, Assistant Professor, DJPS College of Pharmacy

Abstract:

HPLC is the dominant separation technique in modern pharmaceutical and biomedical analysis because it results in highly efficient separations and most cases provides high detection sensitivity. Most of the drugs in multi-component dosage forms can be analyzed by the HPLC method because of the several advantages like rapidity, specificity, accuracy, precision, and ease of automation in this method. HPLC methods development and validation play important roles in the discovery, development, and manufacture of pharmaceutical drugs and various other studies related to humans and animals. An analytical procedure is developed to test a defined characteristic of the drug substance or drug product against established acceptance criteria for that characteristic. An appropriate mobile phase, column, column temperature, wavelength, and gradient must be found that affords suitable compatibility and stability of the drug as well as degradants and impurities. This review gives information regarding various stages involved in the development and validation of the HPLC method. Validation of the HPLC method as per ICH Guidelines covers all the performance characteristics of validation, like Accuracy, precision, specificity, linearity, range and limit of detection, limit of quantification, robustness, and system suitability testing.