REVIEW ARTICLE

POPULATION PHARMACOKINETICS: NOVEL APPROACH TO PHARMACOKINETIC MODELING WITH POTENTIAL APPLICATION IN DRUG DEVELOPMENT AND DOSAGE INDIVIDUALIZATION

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INTRODUCTION: During the process of drug development and evaluation, the pharmacokinetics of therapeutic agents in generally studied in young, healthy volunteers. This study is conducted during phase I of clinical trials to elucidate entire pharmacokinetic profile of the drug being studied. Safety and efficacy studies are performed in patients during phase II and further, but pharmacokinetic studies are not conducted in patients. Once the drug completes Phase III and goes for marketing clinicians are provided with the kinetic data derived from normal healthy volunteer based on which dosage regimens are designed for patients. This approach has an inherent flaw of using healthy volunteer data for patients. Clinicians often have to resort to trial and error method to decide the appropriate dosage, if the recommended dosage regimen did not result in optimal clinical outcome. If the kinetic data for a drug can be derived from patient group in whom the drug may be used, it will result in better prediction of pharmacokinetics behavior. The discipline of population pharmacokinetics attempts to study the pharmacokinetic behavior of drugs in patients. This approach generally uses sparse sampling technique which avoids multiple sampling used in conventional methodology.

REVIEW ARTICLE

SOLID DISPERSIONS: A UNIQUE TECHNIQUE TO IMPROVE THE AQUEOUS SOLUBILITY OF POORLY SOLUBLE DRUGS – A REVIEW

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ABSTRACT: Solid dispersion technology is the science of dispersing one or more active ingredients in an inert matrix in the solid state in order to achieve increased dissolution rate, sustained release of drugs, altered solid properties and enhanced release of drugs from ointment, suppository bases, improved solubility and stability. Most of the drugs are passively absorbed and their rates of absorption depend upon the gradients in each case. By increasing the dissolution rate in the gastro intestinal tract, the rate of absorption is increased as long as the dissolution rate is still the ate-limiting step. Various carries have been used in the formation of solid dispersion, which can facilities in improving the dissolution rate of poorly soluble drugs to improve better bioavailability. The present review highlights various aspects of solid dispersion formulation, carries used in their preparation, methods of preparation, methods of preparation, physicochemical characterization and their application.

REVIEW ARTICLE

BASICS OF PHARMACOINFORMATICS

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The field of pharmacoinformatics encompasses two broad areas – Bioinformatics and Cheminformatics. The objective of pharmacoinformatics is to understand and therefore develop better therapeutics in a rational manner. The history of systematic mathematical approach to drug discovery can be thought to have started in 1960s with the extensive use of Quantitative Structure Activity Relationship (QSAR). QSAR attempts to find a quantitative relationship (or rule) between the structural features, especially substitutent's, of a drug family and the biological activity. Extensive works on developing molecular descriptors were done during this period. QSAR was an important breakthrough, in an era when only limited information about the molecularmechanism of action of drug was known.

RESEARCH ARTICLE

INCIDENCE OF CIPROFLOXACIN RESISTANCE IN TYPHOID FEVER

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ABSTRACT: The problem of drug resistance in typhoid fever also being reported in various parts of the world and also in our country. We have also encountered with resistant strains in our area also. So we through of conducting a study of report the "Incident of Ciprofloxacin resistance in typhoid fever". Enteric fever cases are selected and widal test is done for those cases. The widal positive patients were started on antibiotic Ciprofloxacin in the prescribed dose for 1week. After one week of treatment with Ciprofloxacin the patients are observed for the signs and symptoms of enteric fever along with increase or decrease in widal titre. All cases of suspected typhoid fever were taken up and their clinical presentation was recorded in a proforma and the antimicrobial sensitivity pattern was also recorded with relevant increase or decrease in widal titre. Typhoid patients received Ciprofloxacin earlier either for typhoid or any other infection did not respond to Ciprofloxacin around 84.6% although few percentages around 26.4% respond to Ciprofloxacin. This may be due to the change in mutation. Hence it is suggested that Ciprofloxacin may not be prescribed to typhoid patients who had received Ciprofloxacin earlier. Out of 32 patients six (6) patients who received Ciprofloxacin (100%) very well. Intravenous administration of Ciprofloxone may be administered for the drug of choice for typhoid fever other than Ciprofloxacin.

RESEARCH ARTICLE

COLON TATGETED DRUG DELIVERY SYSTEM OF METRONIDAZOLE

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ABSTRACT: The formulation of the table coated with pH sensitive polymer Eudragit S-100. This acrylic polymer dissolves at a pH 7.4 same as that of lower intestine. The method of preparation of tables is simple were granulation of drugs with excipients followed by compression which assures reproducible batches of tablets. To evaluate the uncoated and coated tables for physicochemical parameters such as hardness, weight variation, thickness, drug content, in-vitro drug release studies. Drug release from the delivery system shows no drug (or) very low amount of drugs release in the next three hours. Nearly 50% of the drug is released in the next three hours. The drug is completely released after 8 hours. This indicates that the dissolving of the polymer stars at pH7.4. Tables having Eudragit S coating with castor oil as the plasricizer meeting both coating standards and desired drug release pattern. The in-vitro study shows that the sytem could be effectively targeted to the lower part of the intestine.

RESEARCH ARTICLE

PREPRATION AND EVALUATION OF ACECLOFENAC MICROSPHERES USING EMULSION SOLVENT EVAPORATION TECHNIQUE

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ABSTRACT: The study was aimed to formulate and evaluate microspheres of water – insoluble drug aceclofenace, using Cellulose ether (Ethyl cellulose) and Copolymer synthesized from acrylic and methacrylic acid esters (Eudragit RSPO) as the retardant material. Microspheres were prepared by emulsion solvent evaporation methods using an acetone/ liquid paraffin system with span 80 as emulsifying agent. The prepared microspheres were characterized for their micromeritic properties and drug loading, as well by Fourier transform infrared spectroscopy (FTIR), and scanning electron microscopy (SEM). The in vitro release studies were performed in 0.1N HCL followed by pH 6.8, phosphate buffer. The prepared microspheres were white, free flowing and spherical in shape. The drug loaded microspheres showed 61.72 to 78.12% of entrapment and the drug release was extended upto 9 to 12 h. The infrared spectra showed stable character of aceclofenac in the drug - loaded microspheres and revealed the absence of drug –polymer interactions. The microspheres were uniform in size with a size range of 68.58mm to 89.3mm. Scanning electron microscopy study revealed that the microspheres were spherical smooth surface. The best- fit release kinetics was achieved with peppas plot followed by zero order and First order. The release of aceclofenac was influenced by the drug to polymer ratio and particle size & was found to be diffusion controlled and non-fickian type.

RESEARCH ARTICLE

FORMULATION AND EVALUATION OF ORODISPERSIBLE TABLES OF MELOXICAM

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ABSTRACT: In the present work, Orodispersible tablets of meloxicam were designed with a view to enhance patient compliance. A combination of superdisintegrants such as Explotab, Ac-Di-Sol, and Polyplasdone XL in different concentrations along with directly compressible mannitol to enhance mouth feel. The prepared tables were evaluated for weight variation thickness, hardness, friability, wetting time, drug content, water absorption ratio, in-vitro dispersion time, in-vitro disintegration time and invitro drug release. Amongst all, the formulation F9 (containing 5%w/w concentration of Polyplasdone XL) was considered to be the best formulation which releases upto 99.33% of the drug in ten minutes.

RESEARCH ARTICLE

EFFECT OF NATURAL MORDANT WITH MARIGOLD FLOWER DYE ON SELECTED FIBERS

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ABSTRACT: In present study Marigold (Tagetes erecta) petals were used for the extraction of the natural dye material. Aloe Vera juice was selected as natural mordant to standardize the dyeing effect of Mari gold dye on natural and synthetic fibers. Natural dye was formulated with Marigold dye and natural mordant aloe Vera juice in the ratio 2:10, 5:10 and 10:10 and the effect was compared with synthetic mordant namely copper sulphate, lead acetate and potassium dichromate with Mari gold dye in the ratio 10:1. Natural dye with Aloe Vera juice in the ratio 10:10 shows a good dyeing effect on the animal fibers when compared to plants or synthetic fibers. The natural dye with aloe Vera juice in the ratio 10:10 was subjected to skin irritation study and the result showed no skin irritation, erythema or edema.

RESEARCH ARTICLE

ANITIOXIDANT AND NITRIC OXIDE SCAVENGING PROPERTY OF TRIGONELLA FEONUM – GRACEUM

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ABSTRACT: Nitric oxide (NO) is biologically referred to as reactive nitrogen species; found elevated in several pathological conditions, including diabetes. The NO scavenging activity of various herbal drugs and its formulations has been reported. The present study was evaluated the total antioxidant capacity and NO scavenging property of Trigonella feonum – graceum (TR) Commonly known as Fenugreek. The total antioxidant capacity of TF aqueous extract was determined based on the reduction of Mo (VI) to Mo (V) by the extract and subsequent formation of a green phosphate/Mo (V) complex at acid pH. NO scavenging activity was examined using sodium nitroprusside as a NO donor in vitro. The extract of TF reduced the generation of NO in a concentration dependent manner. However, the highest NO scavenging activity was observed from 1% solution. The total antioxidant capacity was also found highest in 1% TF as compared to 1mmol of ascorbic acid. The present study suggested that TF has potential nitric oxide scavenging and antioxidant property and can play an important role in the prevention and management of various diseases especially diabetes, cataract and glaucoma.

RESEARCH ARTICLE

POLYMERIC STRIPS CONTAINING SPARFLOXACIN FOR THE LONG TERM TREATMENT OF PERIODONTITS.

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ABSTRACT: Periodontitis, a group of bacterial infections resulting in destruction of the tissue that supports the tooth. The inflammatory responses which bacterial accumulations elicit in the gingival tissue is ultimately responsible for progressive destruction of collagen supporting and periodontal ligament, which, if unchecked, can cause the tooth to loosen and then to be lost. The increased possibility of toxic side effects at higher dose levels of antibiotics not supports systemic administration. Therefore there is a need of a safe and effective low dose; local drug delivery device is highly desirable. Sparfloxacin is a newer antibiotic, shown wide spectrum antibacterial activity against a number of periodontal pathogens. Hence sparloxacin is selected for site specific delivery i.e., into periodontal pocket for the treatment of periodontitis. Sparfloxacin is formulated into strips by using polymers and the prepared strips were evaluated for various properties such as weight variation, tensile strength, moisture loss, stability and in –vitro release studies. The thickness among the different films was uniform. Tensile strength was maximum for plain films and minimum for films containing drug. Dissolution studies showed an initial burst release followed by a progressive fall and extended release of the drug with more uniformity for long time. The in – vitro release kinetics followed zero order pattern and obeys higuchi's diffusion model. The mass balance studies done after the in – vitro dissolution, did not deviate by more than 3% from the experimental drug content. The stability studies did not show any significant changes with respect to content and appearance.