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A REVIEW ON - NOVEL DRUG DELIVERY SYSTEM

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ABSTRCT

In recent years, significant progress has been made in the development of new drug delivery systems (NDDS) for plant compounds and extracts. A variety of novel herbal formulations have been reported, including high molecular weight nanoparticles, nanocapsules, liposomes, phytosomes, nanoemulsions, microspheres, transferases, and etsomes using bioactive and plant extracts. The new formulations include plant active ingredients and extracts, including solubility, bioavailability, protection from toxicity, improved pharmacological activity, improved stability, improved distribution of tissue macrophages, improved sustained delivery and protection. For physical and chemical degradation reported to have significant advantages over conventional formulations. The current review highlights the current state of development of new herbal formulations and summarizes their manufacturing process, active ingredient types, sizes, capture efficiencies, routes of administration, bioactivity, and uses of the novel formulations

1. INTRODUCTION

The method of administering a drug can have a significant impact on its effectiveness. Some medicines have an optimal concentration range for maximum benefit, and concentrations above or below this range may be toxic or provide no therapeutic benefit1. There is an increasing need for an interdisciplinary approach to the delivery of therapeutic agents to tissue targets. This has led to new insights into pharmacokinetics, pharmacodynamics, non-specific toxicity, immunogenicity, biometrics, and control of drug efficacy. These new strategies, often referred to as drug delivery systems (DDS), are based on an interdisciplinary approach that combines polymer science, pharmacies, bioconjugated chemistry, and molecular biology. Various drug delivery and drug targeting systems are currently under development to minimize drug degradation and loss, prevent adverse side effects, and increase the bioavailability of drugs and the proportion of drugs that accumulate in the zone of need.

Yes, the best possibilities are real. Over the last decade, pharmaceuticals and other scientists have conducted extensive and intensive research in this area of drug discovery. Among excipients, soluble polymers, insoluble or biodegradable polymer microparticles, natural and synthetic, microcapsules, cells, cell ghosts, lipoproteins, liposomes and micelles can be cited. The carrier is slowly degradable, stimulus responsive (eg, pH or temperature sensitive), and can even be targeted (eg, by binding to a specific antibody against a particular characteristic component of the region of interest). .. Targeting is the ability to direct a drug-loaded system to a target site. Two major mechanisms can be distinguished to target the target site of drug release.

2. DRUG DELIVERY CARRIERS

Colloidal drug delivery systems such as micelle solutions, vesicles and liquid crystal dispersions, and nanoparticle dispersions consisting of small particles 10-400 nm in diameter have proven to be promising drug delivery systems. The goal in developing these formulations is to obtain a system with optimized drug loading and release characteristics, long shelf life, and low toxicity2. Incorporated drugs are involved in the microstructure of the system and can be particularly influenced by molecular interactions. The drug is amphipathic and / or has mesogen properties

3. PHARMACEUTICAL CARRIERS

Micelles formed by self-assembly of amphipathic block copolymers (5-50 nm) in aqueous solution are of great interest for drug delivery applications. The drug is physically trapped in the core of the block copolymer micelles and can be transported at concentrations that may exceed its inherent water solubility. In addition, hydrophilic blocks can form hydrogen bonds with the aquatic environment and form a dense shell around the micelle core. This effectively protects the components of the hydrophobic core from hydrolysis and enzymatic degradation. In addition, corona can interfere with recognition by the reticuloendotheliatic system and thus prevent the preliminary elimination of micelles from the bloodstream. The final feature that makes amphipathic block copolymers attractive for drug delivery applications is the ability to easily change their chemical composition, overall molecular weight, and block aspect ratio to control the size and morphology of micelles. You can do it. Functionalization of block copolymers with crosslinkable groups can enhance the stability of the corresponding micelles and improve their temporal control. Substitution of block copolymer micelles

4. NANOPARTICLES

Nanoparticles (including nanospheres and nanocapsules sized from 10 to 200 nm) are in the solid state and are either amorphous or crystalline. They can absorb and / or encapsulate the drug, protect it from chemical and enzymatic degradation, and provide the ability to deliver proteins, peptides, and genes orally 11.

Classification of nano materials:

a) Nanotubes
b) Nanowires
c) Nanocantilever
d) Quantum dots
e) Nanopores

Self-contained, individual dosages form that, when applied to intact skin, delivers the drug to the systemic circulation through the skin at a controlled rate. The transdermal drug delivery system "TDDS" has emerged as an integral part of the new drug delivery system28. Percutaneous delivery is an interesting option because transdermal administration is convenient and safe.
The positivefeaturesofdeliverydrugsacrosstheskintoachievesystemiceffectsare

- Avoidance of first pass metabolism
- Avoidance of gastrointestinalin compatibility
- Predictable and extended duration of activity
- Improving physiological and pharmacological response
- Termination of therapy is easy at any point of time
- Greater patient compliance due to elimination of multiple dosing profile
- Provide suitability for self administration
- Enhance therapeutic efficacy

5. OSMOTICALLY CONTROLLED DRUG DELIVERY SYSTEMS

Osmotic pressure is used as a driving force for these systems to release the drug in a controlled manner. Osmotic drug delivery technology is the most interesting and widely accepted of all other technologies used in it. Much research has been done on osmotic systems and several patents have been published. The development of the osmotic drug delivery system was pioneered by Alza, which holds numerous patents analyzed and also sells several products based on the osmotic principle. These systems can be used for both routes of administration. H. Oral and parenteral. The oral osmotic system is known as the Gastrointestinal Treatment System (GITS). Parenteral osmotic drug delivery includes an implantable pump 39.

6. CLASSIFICATION OF OSMOTIC DRUG DELIVERY SYSTEM

Many forms of osmotic pumps are reported in the literature but, in general they can be divided in oral and implantable systems.
Osmotic Drug Delivery Devices fall in two categories:
Implantable:

Oral osmotic Pump
The Rose and Nelson Pump
Higuchi Leeper Pump
Higuchi the uwes pump
Implantable Miniosmoticpump
Single chamber osmotic pump: Elementary osmotic pump
Multi chamber osmotic pump: Push pull osmotic pump, Osmotic pump with non expanding second chamber

SPECIFICTYPES:

Controlled porous osmotic pump, osmotic rupture osmotic pump, liquid OROS, osmotic device, delayed delivery, telescopic capsule, Orosct (colon targeting), sandwich oral therapy system, osmotic pump for insoluble drugs, monosphere Osmotic system and OSMAT 40

MICROENCAPSULATION:

Microencapsulation is the process by which small droplets or particles of a liquid or solid material are surrounded or coated with a continuous film of polymer material. First, the microencapsulation process was discovered in 1931 by Bungenburg de Jon and Kan. This included the production of gelatin spheres and the use of an aging process. Controlled drug delivery systems have been used to alleviate problems associated with conventional treatment and improve the therapeutic effect of a given drug. Maximum therapeutic effect can be achieved by delivering the drug to the target tissue at the optimal rate, with low toxicity and minimal side effects. The microencapsulation process helps convert liquids to solids, alter colloidal and surface properties, provide environmental protection, and control the release properties of various coated materials. Some of these properties can be achieved

by macropackaging techniques, but in microencapsulation, small coated particles were used to make a wide variety of dosage forms, which was impractical. A new drug delivery system initiated in the process of optimizing bioavailability by changing the bioavailability of drug levels in the blood. Sustained-release and sustained-release products can improve drug therapy. This is a common goal achieved with non-sustained and sustained release using the same drug. A microencapsulated product (fine particles) is a small unit with an active ingredient called a core material, surrounded by an envelope called a coating material or embedded in a matrix structure. Most fine particle shells are made of organic polymers, but waxes and lipids are also used. Generally, microencapsulated products (fine particles) are considered to be larger than 1 micron in size and up to 1000 microns in diameter. Commercially available fine particles contained 10-90% by weight of the core. Many core materials can be encapsulated, including: B. Living cells, adhesives, flavors, pesticides, enzymes, medicines. A recent finding in pharmaceutical research is that the rate of drug absorption can be controlled by controlling the rate of release from the dosage form. Sustained release dosage forms are designed and formulated to include sustained release, sustained release, sustained release, sustained release, and sustained release agents. This was achieved through the development of new drugs, the discovery of new polymeric materials suitable for prolonging drug release, increasing safety and improving therapeutic efficacy44

NOVEL DRUG DELIVERY SYSTEM:-IN HERBAL FORMULATIONS:

In the past few decades, considerable attention has been focused on the development of novel drug delivery system (NDDS) for herbal drugs. The novel carrier's should ideally fulfill two pre requisites. Firstly, it should deliver the drug at a rate directed by the need soft he body, over the period of treatment. Secondly, it should channel the active entity of herbal drug to the site of action. Conventional dosage forms including prolonged-release dosage forms are unable to meet none of these.
The variety of novel herbal formulations like polymeric nanoparticles, nanocapsules, liposomes, phytosomes, nano emulsions, microsphere, transfer osomes, and ethosomes has been reported using bioactive and plant extracts 45.
a / blood levels for more consist entresult 53

NIOSOMES:

Iniosomes, the vesicles that form amphiphiles, are nonionic surfactants such as Span-60 and are usually stabilized by the addition of cholesterol and small amounts of anionic detergents such as disetyl phosphate. Will be. Niosomes and liposomes are equally active with respect to drug delivery potential, and both increase drug efficacy compared to that of free drugs. Liposomes are preferred over liposomes due to their high chemical stability and economy. The detergents that form surfactants are biodegradable, non-immunogenic, and biocompatible. Their integration into niosomes enhances the efficacy of drugs such as B. nimesulide, flurbiprofen, piroxicam, ketoconazole, and bleomycin have higher bioavailability than free drugs26.

SONOPHORESIS:

Sonophoresis is a process that exponentially increases the absorption oftopicalcompounds(transdermaldelivery)into theepidermis,dermisandskin appendages by ultrasonic energy. Sonophoresis is a localized, non-invasive,convenient and rapid method of delivering low molecular weight drugs as well as macromoleculesintotheskin.Mechanistically,sonophoresisisconsideredto enhance drug delivery through a combination of thermal, chemical andmechanicalalterationswithintheskintissue.Ultrasoundatvariousfrequenciesin the range of 20 kHz–16 MHz with intensities of up to 3W/cm2 has been usedforsonophoresis.Ultrasoundparameterssuchastreatmentduration,intensity, and frequency are all known to affect percutaneous absorption, with the latter being the most important. Sonophoresis occurs because ultra sound waves stimulate micro-vibrations within the skin epidermis and increase the overall kinetic energy of molecules making up topical agents.

The ultra sound probably enhances drug transport by cavitation, micro-streaming, and heating.Ultrasound mediated transdermal delivery of key compounds was first reported in 1954 by Fellinger and Schmid through successful treatment of digital poly arthritis using hydrocortisone ointment in combination with ultrasound. Sonophoresis is widely used in hospitals to deliver drugs through the skin.

Pharmacists prescribe drugs by mixing them with coupling agents (gels, creams, ointments) that transfer ultrasonic energy from ultrasonic transducers to the skin. Therefore, the application of ultrasound to the skin increases its permeability (sonophoresis), allowing various substances to be delivered within and through the skin. Sonophoresis is also used in physics

REFERENCES

[1] Reddy. P.D., SwarnalathaD.Recent advances in Novel Drug Delivery Systems. IJPTR,2010; 2(3):2025-2027.

[2] Muller.C.C. "Physicochemical characterization of colloidal drug delivery systems such asreverse micelles, vesicles, liquid crystals and nanoparticles for topical administration",EuropeanJournalof Pharmaceutics andBiopharmaceutics.2004; 58(2):343-356.

[3] http://www.azonano.com/oars.asp

[4] SharmaA.InternationalJournalofPharmaceutics.1997;154;123-140.

[5] Lau JR, Geho WB, Snedekar GH, Inventors; SDG INC, An Ohio Corporation, Assignee;Targeted Liposomal Drug Delivery System.US Patent20100209492.2010Aug 19.

[6] Takagi A, Yamashita N, SonobeT, Inventors; Astellas Pharma INC Tokyo, Assignee; Intra cellular Drug Delivery Improving Liposomes.USPatent20070286898.2007Dec13.

[7] Lau JR,Geho WB, Snedekar GH, Inventors; Targeted Liposomal Drug Delivery System. USPatent20070104777.2007May10.

[8] Zhang Y, Luo B, Iyer L, Inventors; Liposomal Delivery Vehicle For Hydrophobic Drugs. USPatent20070014845.2007Jan18.

[9] Yamauchi H, Morita H, Kikuchi H, Inventors; Daiichi pharmaceuticals Co.LTD, Assignee;Liposomes AndLiposomalDispersion.USPatent20020182248.2002Dec5.

[10] Rajan K. Verma and Sanjay Garg, "Current Status of Drug Delivery Technologies andFuture Directions,PharmacuticalTechnology On-Line,25(2),1–14(2001).

[11] AminabhaviT.M.JCR.2001;70;1-20

[12] Manivannan R. Recent Advances In Novel Drug Delivery System. IJRAP. 2010; 1(2); 316-326