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A Review on Novel Drug Delivery System

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ABSTRACT:

There are many good things about new drug delivery systems (NDDs). For instance, they can make drugs work longer and better, make it easier for patients to stick to their treatment by lowering the number of doses they need to take and making it easier to give them, and target specific areas to reduce unwanted side effects. Finding a way to use both new and old drug technologies to get the most benefit for the patient is the biggest problem for both pharmaceutical and drug delivery companies. In the last few years, a lot of progress has been made in making new drug delivery systems (NDDs). Bioactive compounds and plant extracts have been used to make a number of new things, such as polymers, nanocapsules, liposomes, phytosomes, microcefers, and hydrogels. These new preparations are known to improve traditional disease treatments by making them more bioavailable, more effective, more stable, more widely distributed in tissue macrophages, more continuous, and more resistant to physical and chemical decline. This review seeks to clarify the current progress and uses of these innovations.

INTRODUCTION

A drug delivery system (DDS) is a formulation or device that controls when, where, and how quickly a therapeutic agent is released into the body. This makes the drug more effective and safer. This process involves moving these active ingredients across the biological membrane so that therapeutic agents can be given, their active parts can be released, and the target site of action can be reached.

A lot of work has gone into making the new drug delivery system (NDD) better in the last few decades, especially for herbal medicines. These new carriers need to meet two important standards. First, they should give the drug at a rate that is right for the body's needs during the treatment. Second, they need to send the herbal medicine's active ingredient to the right place. Traditional doses, which are made for long-term release, do not meet one of these criteria. The review of phyto-formulation looks at how nanodose forms have changed over time and points out many benefits for polymeric nanoparticles, nanocapsules, liposomes, solid lipid nanoparticles, phytosomes, and drugs. These benefits include better solubility and bioavailability, protection against toxicity, increased medicinal effectiveness, better stability, better distribution for tissue macrophages, long-lasting distribution, and protection against physical and chemical degradation.

This review seeks to analyze progress in herbal Nanoparticle Drug Delivery Systems (NDDS), focusing on various methods for encapsulating nanoparticles with phytoconstituents and their roles in improving drug delivery. We will talk about the good things about these new systems, such as how they work better, need less medicine, and have fewer side effects. We will also show you some herbal products that were made with these technologies. Combining modern drug delivery systems with traditional herbal medicine is a big step forward in the search for safer and more effective treatments for a wide range of health problems.

ADVANTAGES OF NOVEL DRUG DELIVERY SYSTEM

1. Protection against physical and chemical decline.
2. Continuous administration.
3. Enhanced distribution of tissue macrophages
4. Improves stability.
5. Promotion of medicinal activity.
6. Security against poisoning.
7. High bioavailability.
8. Improvement in solubility

TYPES OF NOVEL DRUG DELIVERY SYSTEM

The novel drug delivery systems (NDDs) are innovative approaches to distribute drugs in a more efficient, controlled and targeted manner than traditional methods. The main types of novels here are drug delivery systems, which are classified by mechanisms and applications:

1. Controlled drug distribution system
2. Targeted drug delivery system
3. Nanotechnology-based distribution
4. Vasicular drug delivery system
5. Biodegradable and implanted system
6. Transdermal Drug Delivery System (TDD)
7. Mucoradesiv drug delivery
8. Osmotic pump system
9. Breathing and pulmonary distribution
10. Ocular Drug Delivery Systems

PHYTOSOMES

Phytosomes are molecular structures that interact effectively with lipids. "Phyto" means "plants," and "some" means "structures that are like cells." Phytosomes are a new way to deliver herbal drugs. They work by mixing polyphenolic phytoconstituents with phosphatidylcholine in a specific molar ratio.

Phytosomes are a new kind of herbal product that are better than regular herbal extracts because they are easier to absorb and use. When they are different from traditional herbal extracts, their pharmacokinetic and medical profiles are better.

LIPOSOMES

A liposome is a tiny vesicle with a lipid bilayer membrane that surrounds a watery volume. Liposomes, which are also called vesicles or colloidal regions, are made of cholesterol, different kinds of surfactants, sphingolipids, glycolipids, long-chain fatty acids, membrane proteins, and therapeutic molecules. Depending on the lipids that make them up, their surface charge, size, and how they are made, liposomes can have very different properties. The charge of "hardness" or "liquidity" and billiar is also affected by the parts that make up the billor. Liposomes can interact with things that are both hydrophobic and hydrophilic. They can also stop combinations from eroding during the targeted release of encapsulated materials more effectively. This is why they are good for research and for selling drugs.

NANOPARTICLES

Nanoparticles (NPs) are a kind of colloidal drug delivery system made of natural, synthetic, and semi-synthetic polymers. NP particles can be as small as 10 nm and as big as 1,000 nm. The design of nanoping as delivery systems includes particle size, controlling surface properties, and the release of medicinally active compounds, all aims to obtain the site-specific action of the drug on the optimal therapeutic rate and dose diet. Nanoparticles help drugs get to their target sites by going around the reticulondothelial system and using effects that make them more permeable and keep them longer. They also use strategies that are specific to the target.

EMULSIONS

An emulsion is a bipolar system in which one phase is made up of small droplets with diameters between 0.1μm and 100μm. One of the stages in an emulsion is always water or something that lives in water, and the other stage is always an oily liquid that doesn't have any color. People usually call a microelemson a nanolyson, and a sub-microamsian a liquid emulsion. A microemulsion is clear, stable in thermodynamics, and is often used with a co-surfactant.

MICROSPHERES

Microcefers are usually proteins or synthetic polymers that break down naturally and have particle sizes between 200 and 500 micrometers. There are many ways to control how drugs are delivered and make them work better by using different methods to make microsefers. There are many ways to give

a drug that will stay in the body and be released slowly where it is needed. Microcefers were useful for a lot of things because they could be let out in a steady and controlled way.

ETHOSOMES

Ethosomes are made up of phospholipids and a lot of ethanol. This carrier can get deep into the skin, which helps the drug get to the deeper layers and the bloodstream of the skin. They are good for putting alkaloids on people's skin in gel and cream forms because they make them feel better. They show that lipid domains that change can make the skin more permeable.

NIOSOMES

Niosomes are vesicles that have more than one membrane. They are made of cholesterol-based alkyl or dialkylpolyglycerol ether class and non-ionic surfactants. Previous studies suggest that Niosomes, in contrast to L'Oreal, exhibit properties that may enable them to serve as drug carriers similar to liposomes. Niosomes and liposomes are not the same thing; niosomes have some benefits over liposomes.

PRONIOSOMES

Proniosomes are better than niosomes because they can be used in a lot of different ways to get active compounds to certain places. Proniosomal gels are like yoga that turns into niosomes. These niosomes help insects stay hydrated by taking water from their skin.

Application of Novel drug delivery system

1. Targeted Pharmaceutical Delivery
2. Controlled Release
3. Tailored Medicine
4. Management of Chronic Diseases
5. Combination Therapies
6. Gene and Cell Therapies
7. Immunizations
8. Transdermal Administration

CONCLUSION

A novel integrates sophisticated methodologies for drug delivery systems (NDDs) with innovative dosage forms that surpass conventional ones. This new way of getting drugs to people makes them work better by making them less toxic, giving them more often so they are easier to get, and solving the problem of not being able to get them. Nanoparticulate drug distribution systems and vesicles are likely to be used in AIDS treatment with vaccines, radiation therapy, antibiotics, anti-tumor agents, proteins, and gene therapy to get drugs past the blood-brain barrier.

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