

A REVIEW OF NOVEL HERBAL DRUG DELIVERY SYSTEM

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ABSTRACT

Plants are nature's remedies and have been used by human beings on earth since ancient times for food and medicine. Today there are global movements towards finding of herbal medicaments in plants to bring them in market via a suitable drug delivery system for mankind. The basic thought behind it is treatment of each disease is hidden in nature. However, delivery of herbal drugs also requires modification with the purpose to achieve sustain release, to increase patient compliance etc. previously herbal drugs could not attract scientists towards the modifications of novel drug delivery systems due to processing, standardizing, extracting and identification difficulties. But now days with the advancement in the technology, novel drug delivery systems (NDDS) open the door towards the development of herbal novel drug delivery system. With use of advance techniques protection from toxicity, enhancement in stability, improved bioavailability of herbal formulations, protection from physical and chemical degradation can be achieved. Novel drug delivery technologies have gained the importance to achieve modified delivery of herbal drugs their by increasing the therapeutic value as well as reducing toxicity.

The present reviews gives information regarding various novel techniques used for improving safety and efficacy of phytomedicines and application of novel formulation. The main goal for developing such delivery systems is to minimize drug degradation and loss, to prevent harmful side effects and to increase bioavailability. Targeting is the ability to direct the drug loaded system to the site of interest. Among drug carrier one can name soluble polymers, microparticles made of insoluble (or) biodegradable natural and synthetic polymers, microcapsules, cells, cell ghosts, lipoproteins, liposomes and micelles. Two major mechanisms can be distinguished for addressing the desired sites for drug release, (a) Passive and (b) Active targeting. Controlled drug carrier systems such as micellar solutions, vesicles and liquid crystal dispersions, as well as nanoparticle dispersions consisting of small particles of 10–400nm show great promise as drug delivery systems. Hydrogels are three dimensional, hydrophilic, polymer networks capable of imbibing large amounts of water or biological fluids.

Keywords: Phytosome, Liposome, Niosome, Transferosome, Ethosome, Nanoparticles, Microsphere, Microemulsion, Nanoparticle.

I. INTRODUCTION

In the past few decades, considerable attention has been focused on the development of novel drug delivery system for herbal drug. Incorporation of herbal drug in delivery system also aids to increase in solubility, enhance stability protection from toxicity, enhanced pharmacological activity, improved tissue macrophage distribution, sustained delivery and protection from physical and chemical degradation. In novel drug delivery technology, control of the distribution of drug is achieved by incorporating the drug in carrier system or in changing the structure of the drug at molecular level. The phytochemical carriers have been studied for effective delivery of herbal extract. Other vascular assemblies like microspheres, nanoemulsion polymeric nanoparticles etc.

Department of new drug molecules is expensive and time consuming process. Formulation of any herbal product by the using Preparation of plants or plant parts are generally utilizes in medication since old time. From this novel thoughts on controlling the pharmacodynamic, pharmacokinetics, immunogenicity, bio acknowledgments and adequacy of medication were created. Quality consistency is one of the fundamental credits of meds, yet it is likewise a troublesome issue that normal drug and their arrangement should confront. First is developing the drug at predetermined rate over the period of treatment. In the present article an attempt has been made to touch upon various aspect and application related to novel herbal drug formulations. Novel drug delivery system it's new approach for herbal drug. Novel drug delivery system overview of different types of drug delivery systems Like microparticles, nanoparticles, Liposomes, Niosomes, Traditional drug delivery,

Microencapsulation. incorporating active ingredients and potential advantages of such system.

II. OBJECTIVE

Objectification of new medicine delivery technology to plant actives minimizes the presystemic metabolism, declination of the medicine in the gastrointestinal tract, distribution/ accumulation of the medicine in the non-targeted apkins and organs, and hence, reduces the side goods and improves the remedial efficacy and eventually, the patient compliance.

III. DIFFERENT TYPES OF NOVEL HERBAL DRUG DELIVERY SYSTEM:

1. Phytosomes
2. Liposomes
3. Niosomes
4. Transferosomes
5. Ethosomes
6. Microsphere
7. Microemulsion
8. Nanoparticle

1. PHYTOSOME:

The 'Phyto' means the plant while 'some' means cell like. o Phytosomes are little cell-like structure. Most active pharmaceutical ingredient of herbal drug are polar in nature or water soluble in nature due to that problem in absorption, restricts the utilisation of these type of compound which ultimately decreases the bioavailability

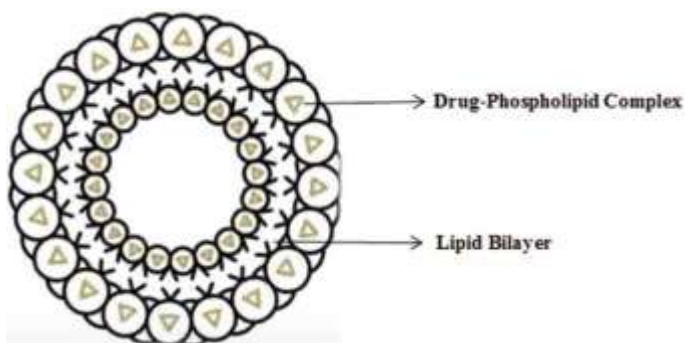


Fig 1: Phytosome

Advantages:

1. Enhance bioavailability of derma care product.
2. Considerable drug entrapment

Disadvantages: A major disadvantages of phytosome is leaching of the phytoconstituents off the 'some' which reduces the desired drug concentration indicating their unstable nature.

2. LIPOSOME:

Liposomes can be classified on the basis of size and number of bilayers. Liposomes are lipid base medicine delivery system. Cholesterol is important for maintaining the stability of liposome

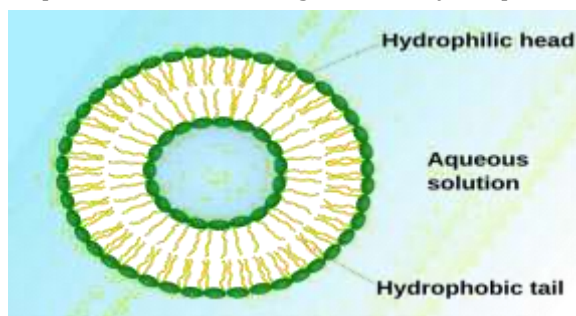


Fig 2: Liposome

Advantages:

1. Increase the efficacy and therapeutic index.
2. Increase the stability via encapsulation .
3. Reduction in toxicity of the encapsulated agent

Disadvantages

1. Low solubility.
2. Short half life

3. NIOSOME:

The first Niosomes formulations were developed and patented by L’Oreal in 1975. The Niosomes are amphiphilic in nature ,in which the medication is encapsulated in a vesicle which is made by non – ionic surfactant are present and hence they are called as Niosomes

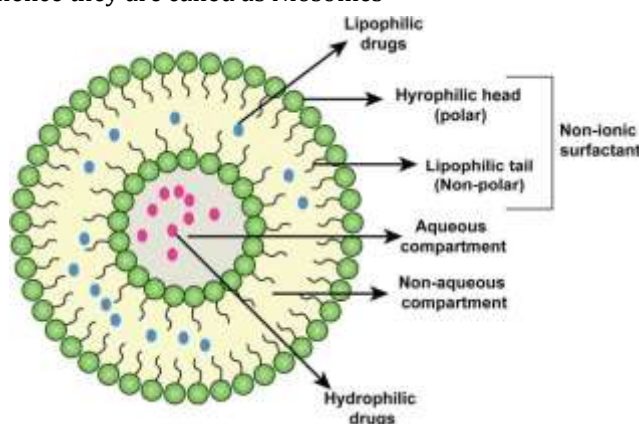


Fig 3: Niosome

Advantages:

1. Niosomes provide targeted drug delivery system.
2. Enhance the bioavailability and skin penetration

Disadvantages

1. Time consuming process.
2. Specialized equipments are required for processing.
3. .Physically unstable

4. TRANSFEROSOME:

It is a deformable vesicle with an aqueous center surrounded by the complex fat bilayer. Transferosomes are sac - like vesicle composed of phospholipid that act as potential carriers for the delivery of the drug through transdermal route.

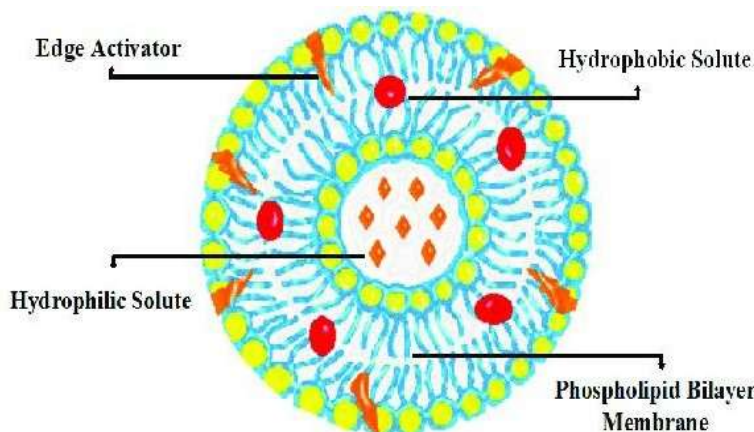


Fig 4: Transferosome

Advantages:

1. This high deformability gives better penetration of intact vesicles.
2. Transfers have a hydrophobic and hydrophilic infrastructure Together and as a result ,drug molecules with a wide variety of Solubility.

Disadvantages:

1. Purity of natural phospholipids is another criteria militating against adoption of transfersomes as drug delivery vehicles.
2. Transfersomes formulations are expensive

5. ETHOSOME:

Ethosomes are ethanolic liposomes, it's define as the non-invasive delivery carriers that enable drugs to reach deep into the skin layers and/or the systemic circulations.

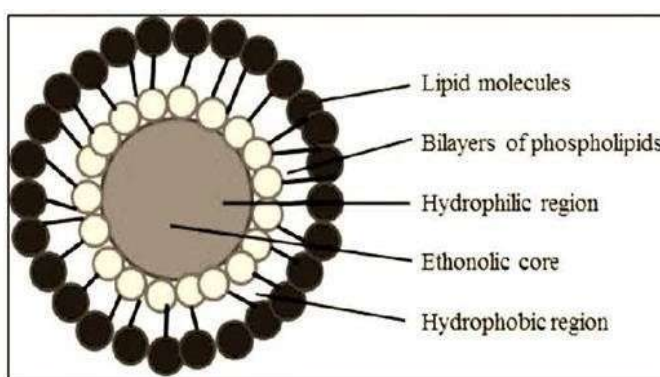


Fig 5: Ethosome

Advantages:

1. Delivery of large molecules is possible.
2. It contains non-toxic raw material in formulations.

Disadvantages:

1. May not be economical
2. Loss of product during transfer from organic to water media.

6. MICROSPHERE:

Microspheres are separate globular patches ranging in average flyspeck size from 1 to 50 μ. Microparticulate medicine delivery systems are studied and taken on as a dependable one to deliver the medicine to the target point with particularity, to assert the asked attention at the situation of interest without untoward goods.

Advantages:

1. Improvement of protein and peptides drug delivery.
2. Ability to bind and release of high concentration of drug.
3. First pass effect can be avoided

Disadvantages:

1. The fate of polymer matrix and it's effect on the environment.
2. There are differences in release from one to another dosage form.

7. Microemulsion:

Microemulsion is clear, stable, isotropic liquid mixture of oil, water and surfactant, frequently in combination with a co-surfactant. The two basic types of microemulsions are direct and reversed.

Advantages:

1. Stable at room temperature.
2. Low surfactant need to achieve high efficiency

Disadvantages:

1. Use of a large concentration of large concentration of surfactant and co surfactant is necessary for stabilizing the droplets of microemulsion.
2. Limited stabilizing capacity for high melting substances used in the system.

8. NANOPARTICLE:

Nanoparticles have different dimensions ,to shape and size apert from their material. Nanoparticles are composed of synthetic or semi synthetic polymers having nano or sub nano sized structures. Nanoparticles show several advantages like solubility enhancement ,efficacyenhancement , bioavailability enhancement ,dose reduction and improved absorption of herbalmedicines. They are designed to improve the pharmacological and therapeutic effect of the drug.

Advantages:

1. Control release and particles degradation characteristics can be readily modulated bythe choice of matrix constituent.
2. Various routes of administration are available including oral, nasal, parentral,intraocular.
3. Diagnosis, treatment ,and management of cancer.
4. **pH** – sensitive or temperature sensitive to establish and regulate

Disadvantages

1. Included in the list of disadvantages of this science and its development is the possible loss of jobs in the traditional farming and manufacturing industry.
2. Presently, nanotechnology is very expensive and developing it can cost you a lot of money. It is also pretty difficult to manufacture, which is probably why products madewith nanotechnology are more expensive

IV. CONCLUSION

Novel Drug delivery System(NDDS) is a combination of advance ways and recently designed lozenge forms which are much more better than conventional lozenge forms. Advantages of Novel Drug Delivery System are Optimum cure at the right time and right position, Effective use of precious medicines, excipients and reduction in product cost, Beneficial to cases, better remedy, bettered comfort and standard of living. introductory modes of new medicine delivery systems are Targeted Drug Delivery System, Controlled Drug Delivery System etc. new medicine delivery & medicine targeting is new ways which is used in pharmaceutical wisdom. Like targeting medicine molecules, vaccine delivery, Gene remedy, marketable development of novel carries(liposomes).

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