• An Overview On :- Novel Herbal Drug Delivery System

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ABSTRACT

The new drug delivery system is a new approach to drug administration that takes into account the limitations of traditional medicine delivery systems. Our country has a vast knowledge of Ayurveda, the potential of which is being realized only recently . a year However, the dosage system of the herbal medicine for the patient is traditional and outdated, which leads to a decrease in the effectiveness of the medicine. When a new drug delivery technique is applied in herbal medicine, then can help increase the effectiveness of various herbal compounds and herbs and reduce side effects. It is elementary the idea of incorporating a new method of sending drugs into herbal medicines. That is why it is important to integrate a new drug distribution system and Indian Ayurvedic medicines to fight more serious diseases.

Keywords: *Herbal medicines, medicinal plants, new drug delivery system, phytopharmaceutical preparations*

•INTRODUCTION:-

Developing a new drug molecule is an expensive and time-consuming process. Herbal preparations means a dosage form containing one or more herbs or processed plant material in a given form amount to provide various benefits such as nutritional, cosmetic or medical benefits.

Herbal preparations are obtained by subjecting the whole plant or any part of it to the treatment of some disease or disorder. Preparation of all herbal products by distillation, extraction, expression, fractionation, purification, infusion, digestion, percolation, maceration. These include chopped butter ground herbal substances, tinctures, extracts, essential oils, pressed juices and processed secretions.

[1] Basically, herbal medicines consist of plant parts or crude plant extracts which contain several pharmaceutical active ingredients, have a pharmacological effect and are often They are generally thought to work synergistically.

[2]In terms of side effects, herbal remedies seem to rare and light.

[3] The safety and effectiveness of all drugs depends on the therapeutic index, e.g compared to traditional medical systems, herbal medicines have more benefits and fewer side effects.

[4]Drug delivery and site specificity of herbal medicines show lack of results, but using (NDDS) new drug delivery system such as microparticles, nanoparticles, liposomes, niosomes, Transdermal drug delivery, microencapsulation, dendrimers.

[5] Adding herbs to medicines higher (NDDS) not only reduce repeated dose and exceed mismatch, but also helps increase therapeutic value by reducing toxicity and increasing toxicity bioavailability of herbal medicines.

[6] A new drug delivery system and a new approach to herbal medicine. This helps to evaluate the available herbal drug molecule with long lasting effect for more effective administration drug release and good distribution are achieved by incorporating the drug into a suitable delivery system.[1]

•Types of novel herbal drug delivery systems:-

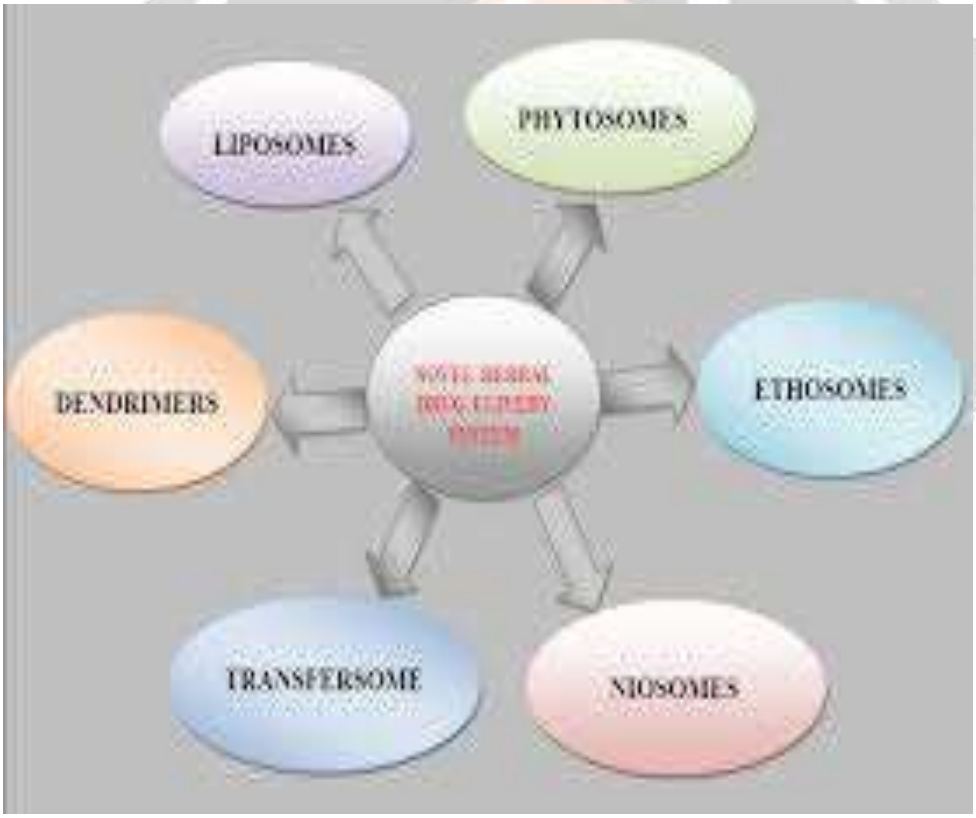

Fig:-Types of novel herbal drug delivery systems [2]

•salient features of NHDDS:-

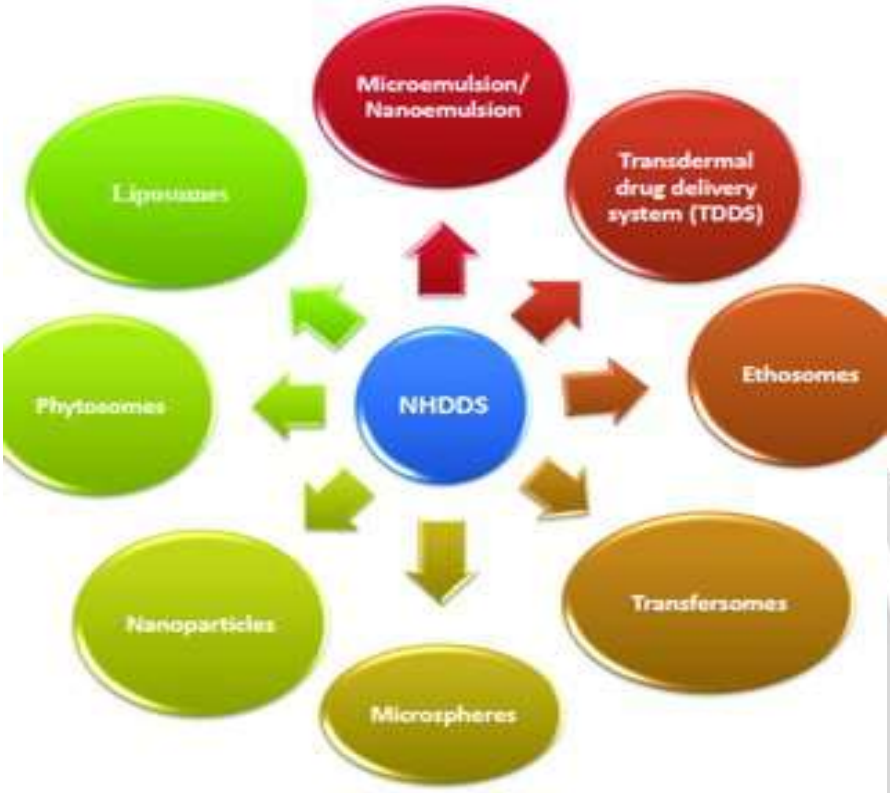

Fig:- salient features of NHDDS [3]

•LIST OF SOME HERBAL DRUGS USED IN CANCER THERAPY:-

S.No.	Common name	Botanical Name	Active Constituent	Part Used	Family	Reference
1.	Arjuna Bark	*Terminaliaarjuna*	Arjunolic acid, Arjunic acid	Bark	Combertacae	1, 35
2.	Kalmegh	*Andrographis Paniculata*	Andrographolide	Dried leaves	Acanthacae	1
3.	Vinca	*Catharanthus Roseus*	Vinblastine, Vincristine	Whole plant	Apocynacae	1
4.	Sambong	*Blumeabalsamifera*	Blumeatin, quercetin, rhamnetin	Leaves	Asteraceae	36
5.	May Apple	*Podophyllum Peltatum*	Podophyllotoxin, Quercetin	Dried Rhizome	Berberidacae	1,35

Chart :-LIST OF SOME HERBAL DRUGS USED IN CANCER THERAPY[4]

•Marketed Herbal Novel Drug Delivery formulation :-

The market for these systems is dominated by two companies,

namely Kosmetochem and Indena. for the supply of herbal medicines, Cosmetochem launches Herbasec® technology which are actually liposome preparations of different plant origin ingredients such as white tea, green tea, white tea extracts hibiscus, gurana and aloe vera. These extracts are used e.g cosmetics because they have a preventive antioxidant effect about aging.

Indena has patented the phytosome® technology and launches many products based on it multiple therapeutic benefits. Indena markets the plant licorice ingredients/extracts (18ß-glycyrrhetinic acid), Ammi visnaga (visnadin), Centella asiatica (triterpenes), G. biloba (ginkflavone glycosides, gincolides, bilobalides), Hawthorn flower (vitexin-2″-O-rhamnoside), milk thistle (silymarin and silybin), horse chestnut (eschin ß-sitosterol), Terminalia sericea (sericoside), Panax ginseng (ginsenosides), grape seeds (polyphenols), green tea (polyphenols), etc.[6]

•Herbal Transfersomes and ethosomes as drug delivery:-

Herbal transfersomes and ethosomes as drug delivery systems

Plants/constituents	Applications category	Therapeutic Wrt Nanotechnology	Reference
Capsaicin transfersomes	Analgesic	Increase skin penetration	[79]
Colchicine transfersomes	Antigout	Increase skin penetration	[74,80]
Vincristine transfersomes	Anticancer	Increase entrapment efficiency and skin	[73]
Matrine ethosome	Anti-inflammatory	Improve the percutaneous permeation	[81]
Ammonium glycyrrhizinate ethosomes	Anti-inflammatory	Increase of the *in vitro* percutaneous permeation	[82]

•Other novel approaches :-

In a observe through Ma et al., the impact and mechanism of Shuanghua aerosol (SHA) became investigated on higher respiration tract infections in kids elderly from three to fourteen years. SHA includes Flos Chrysanthemum Indicum, Flos Lonicera, Herba Houttuynia, Radix Bupleurum and menthene. The manage remedy became Shuanghuanglian aerosol, which includes Flos Lonicera, Fructus Forsythia and Radix Scutellaria. The authors finish that SHA has apparent anti inflammatory and antiviral results and has an awesome healing impact in treating childish higher respiration tract infections.[7]

Gugulipid is a standardized extract organized from the oleo gum resin of Commiphora wightii been clinically established to lessen the degrees of dangerous serum lipids withinside the blood stream. Microparticles of Gugulipid had been formulated with the aid of using unique strategies the use of Chitosan, egg albumin, sodium alginate, ethyl cellulose, cellulose acetate, gelatin and beeswax. The microparticles had been evaluated for his or her physicochemical characteristics. The high-overall performance liquid chromatography (HPLC) profile confirmed awesome separation of Guggulsterone-E and -Z, confirming entrapment of Gugulipid withinside the organized microparticles.[8]

Microcapsules with entrapped natural water-soluble extracts of plantain, Plantago most important and Calendula officinalis L. (PCE) have been organized via way of means of layer-via way of means of-layer adsorption of carrageenan and oligochitosan onto calcium carbonate microparticles with their next dissolving after the remedy of ethylenediaminetetraacetic acid. Entrapment of PCE became carried out the use of adsorption and coprecipitation techniques. The coprecipitation supplied higher entrapment of PCE into the carbonate matrix as compared to

adsorption.In vitro launch kinetics became studied the use of synthetic gastric juice. Applying the version of acetate ulcer in rats, it's been validated that PCE launched from the microcapsules speeds up gastric tissue repair.[9]

Nanoparticles (TCH) from traditional Chinese herbs help improve their absorption and distribution in the body, increasing their effectiveness. TCHs, including peach seed, safflower, angelica root, skechwan rhizome, rehmannia root, red peony root, leech, bird, earthworm, and ground beetle, were mixed and prepared by drying, [86] grinding, extraction, and crushing into liquid particles. . . . ultrasonic wave, filtration and nanometering into nanoparticles by nanometer bounce. Nanoparticles of TCHs have shown significant thrombolytic activity, causing rapid recovery from arterial embolism and reduction of thrombi. The thrombolytic effect of TCHs nanoparticles is much stronger than their non-nanoparticle counterparts. There are also some studies on the integrated evaluation, pharmacokinetics, and pharmacological activity of oral depot preparations of traditional Chinese medicine.[10]

A new long-lasting plant extract implant using chitosan has proven to be very useful. Danshen extract (Radix Salvia miltiorrhiza), a medicinal plant, was developed with CS gelatin as an implant to promote anastomosis and muscle and tissue healing in organic abdominal incisions. Measurements were made of the sustained release of tanshinone IIa, a label component, from the material in vitro. The dissolution medium was determined by the HPLC method. Biodegradability studies of the material were also performed both in vitro and in vivo. Film made from this material worked for a long time. The discharge profile follows the Higuchi equation. A maximum of approximately 20% of the added drug was released within 15 days in the CS-gelatin (1:2) matrix. Drug release was found to be effectively controlled by the amount of drug loaded in the matrix. The improved membrane (CS/gelatin ratio 1:16) can be hydrolyzed in vitro by lysozymes in 4 days. This 0.5 cm2 film was implanted and completely degraded in rats within 28 days and animals and abdominal incisions healed well.[11]

•NOVEL HERBAL DRUG DELIVERY SYSTEMS (NHDDS)

Standard dosage forms, including delayed-release dosage forms forms, cannot satisfy both, keeping the drug component a a particular amount according to the needs of the body, during the treatment and guide phytoconstituents to the desired target for ultimate therapeutic response [12].

herbal preparations mean a preparation containing at least one herb or processed herb to set clearly healthy amounts, remedial benefits and miscellaneous benefits used to analyze, treat or modify the physiology of individuals. to improve the cost-effectiveness of herbal medicines, a new drug delivery system plays an important role an interesting mix of various parts of science, e.g. polymer innovation, pharmaceuticals, immunology, subatomic science etc.[13]

Recent developments in novel drug delivery systems of herbals:-

1] PHYTOSOME

2] Liposome

3] Nanoparticles

4] Emulsions

5] Microsphere

1] Phytosome:-

A valuable and effective method of delivering herbal drugs has been established in the use of phospholipid-based drug delivery systems.[14]

A novel herbal medication delivery method called a "Phytosome" is created by complexing the polyphenolic phytoconstituents in a molar ratio with phosphatidyl choline.[15]

Advantages of phytosome formulation :-

1. Phosphatidylcholine molecules in Phytosome establish chemical bonds, which contribute to its high stability.

2. The dosage of phytosome is minimal because it enhances the absorption of active ingredients.[16]

2] Liposome:-

The solvents that are freely floating within the liposome are encapsulated by spherical particles. A portion of the solvent is encapsulated by the spherical liposomes, which then freely diffuse (float) into their core.[17]

3] Nanoparticles:-

Polymers that are semi- or nano-synthetic can form structures as small as nanoparticles. Colloidal systems with particles ranging in size from 10 nm to 1000 nm are known as nanoparticles. Because the formulation is easily encapsulated in it and may easily reach the effective site, it is an effective system.

An efficient technique to shield food or medicine ingredients from deterioration, volatile losses, or premature contact with other ingredients is to microencapsulate herbal extract in nanopaticulate.[18]

4] Emulation:-

A biphasic system, an emulsion has one phase that is deeply distributed throughout the other phase as tiny droplets with a diameter ranging from 0.1 μm to 100 μm. An emulsion always consists of two phases: an oily liquid, or nonaqueous phase, and water, or the aqueous phase. Among them, the sub-microemulsion is known as lipid emulsion, and the micro-emulsion is also known as nanoemulsion. [19]

A transparent, isotropic, thermodynamically stable mixture of water, oil, and surfactant—often in conjunction with a cosurfactant—is known as a microemulsion (ME).[20]

Advantages of emulsion – based formulations :-

1. Because it is packed in the inner phase and comes into direct touch with the body and other tissues, it can release the medicine for a considerable amount of time.

2. The lipophilic medications are converted into an o/w/o emulsion, which causes the oil droplets to be phagocytosed by macrophages and raise the concentration of the drug in the kidney, spleen, and liver.

5] Microsphere:-

There are two types of microspheres: biodegradable and nonbiodegradable.

Albumin microspheres, modified starch microspheres, gelatin microspheres, polypropylene dextran microspheres, polylactic acid microspheres, etc. are examples of biodegradable microspheres.[21]

Advantages of microsphere formulation:-

1. The use of microspheres for pharmaceutical administration is useful since they can be injected or swallowed, customized for desired release patterns, and used to deliver drugs to specified sites, including organs in some situations.

2. The drug is readily released from the mixture.

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