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Review Article

Bilosomes-an Innovative Trend in Lipid Based Drug Delivery

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Abstract

Pharmaceutical industries are now focused towards research and development of new drug delivery technologies to fulfill the needs of the modern world. Innovations with lipid based drug delivery have become a vital component of development in dosage form. Many formulations and innovations in controlled and targeted drug delivery have been attempted for the release of drug at the right place in a safe and reproducible manner. Liposomal drug delivery systems has become successful and has led to many development in liposome based formulations like niosomes, ethosomes, transferosomes, bilosomes, etc. Bilosomes are colloidal novel drug delivery systems similar to other liposomal delivery systems but prepared by incorporating bile salts into the lipid bilayer membrane. This present article focuses on the bilosomal drug delivery systems.

Keywords: liposomal delivery systems, lipid bilayer membrane, drug delivery, niosomes, ethosomes, transferosomes, bilosomes.

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Introduction

In this modern era of drug discovery, there is a remarkable growth in the use and development of drug[1]. Pharmaceutical industries strive to meet the needs of the global demand. Novel drug delivery systems from already existing drug molecules have becomes the new scenario of the pharmaceutical world than to discover new drug moieties[2]. This can be achieved by developing a carrier system to keep the drug molecule intact and take them to the right direction to the target cells thereby exert action without altering the regular activities of the body. Thus phospholipids mediated delivery of drugs has been introduced for treatment of various diseases[3]. The therapeutic efficacies of these delivery systems are enhanced due to their specific delivery to the target organs like tissues or cells, controlled release etc.

This lipid based drug delivery systems has been used as effective carriers in delivering drugs like anticancer agent, vaccines, antigens, genetic materials, imaging agents. The principle components of these lipoidal systems are the phospholipids like phosphatidyl choline, phosphotidyl glycerols and cholesterols[4].

Advantages of vesicular drug delivery[5,6]

- Poorly soluble drugs have increased bioavailability because of the lipid covering.
- It acts as an efficient sustained release dosage form.

- Due to increase in bioavailability increase in therapeutic index and efficacy of the drug is achieved.
- Both hydrophilic and lipophilic drugs can be incorporated.
- Because of the drug being encapsulated within lipid barriers, they remain stable.
- Less toxicity, improved patient compliance and easy administration.

There are various novel lipid based carrier systems which includes ethosomes, transferosomes, niosomes, bilosomes, virosomes, emulsomes[7] etc.

This review article is aimed to give an overview about one of the lipid based carrier systems-The bilosomes.

Bilosomes-Background

They are novel innovative carriers of drug delivery which consists of bile salts incorporated into niosomal membrane. This is formulated with an aim to protect the membrane against effect of bile acids in gastrointestinal tract[8]. Further bile salts even act as penetration enhancers. Since these are produced from naturally occurring lipids, they are biocompatible, non toxic and also have high bioavailability of the drug[9].

So far there has been numerous research works carried out on different drugs using bilosomal system, few examples are

Jitender *etal* investigated the effect of bilosomal oral vaccine delivery using different blend ratios of monopalimitoyl glycerol, cholesterol, diethyl phosphate and sodium deoxycholate. His study resulted in reduction of median temperature differential change and decrease in viral cell load in influenza[10].

Another study by I.J Ayogu explained that insulin delivered with soya bean lipid extract showed better bioavailability than the normal drug administration.

Shukla *etal* showed that systemic as well as mucosal responses of antibody on oral administration of HBsAg loaded bilosomes[11].

One of the study on vaccines proved that the degradation of antigen in the GI tract and the inability to create a mucosal antibody response were solved due to the conversion of normal vaccine into bilosomal vaccine delivery.

Preparation of Bilosomes

Bilosomal drug delivery systems can be prepared by similar methods of preparations of ethosomes and other lipid based delivery systems[12].

There are 4 methods of preparation

1. Cold Method
2. Hot Method
3. Classic mechanical dispersion method
4. Classic method.

Characterisation of Bilosomes

Once the formulation of bilosomes has been completed the bilosomes should undergo characterisation studies for their shape, size, morphology, vesicle size, surface charge[13] etc.

Shape, size, morphology:

These studies were carried out by Transmission Electron Microscopy by using 0.2% phosphotungstic acid solution.

Vesicle size:

The vesicle size can be determined by zeta seizer and even the polydispersity index can also be determined by the same.

Zeta potential measurement can be performed to determine the surface charge of the bilosomes.

These are the basic characterisation studies involved in bilosomes other studies like *invitro* release study, *invitro* binding specificity, stability in simulated gastric fluid, fluorescence microscopy can be performed to determine the stability and efficiency of the product[14].

Conclusion

Vesicular drug delivery system has now changed the direction of researchers towards development of these delivery systems due to the enormous advantages being rendered by this kind. These delivery systems deliver the drugs directly to the target tissue and they are deformable too[15]. They decrease

dosing frequency and so various researches are being conducted on these dosages in the last few years.

These bilosomes can reduce toxic effects, over dosing and they have been identified to show their therapeutic efficacy from topical to genetic levels.

Thus, bilosomal drug delivery system can behave as an essential dosage form in the pharmaceutical field.

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