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School of Pharmacy and Pharmaceutical Sciences
Isfahan University of Medical Sciences

Formulation and characterization of insulin chitosomes

A. Yadegari[1,*], E. Moghimipour[1], S. Kargar Boldaji[1], A. Jahangiri[2]

[1]Department of Pharmaceutics, School of Pharmacy, Jondishapur University of Medical Sciences, Ahvaz, Iran
[2]Department of Medicinal Chemistry, School of Pharmacy, Jondishapur University of Medical Sciences, Ahvaz, Iran

Background and Aims: There have been extensive researches to formulate non-injectable preparations of insulin. The goal of the present study was to formulate a relatively stable form of insulin using different vehicles such as liposome, alone and in combination with chitosan.
Methods: Different (6:2, 7:2 and 8:2) ratios of phosphatidylcholine and cholesterol were utilizes to formulate liposomes by dehydration-rehydration method. DRVs were then placed in chitosan solution (pH=7) in 1:1 ratio for one hour to for the complexes. Different formulations were characterized and their physico-chemical properties, such as particle size and surface charge were evaluated. They were also examined for their release behavior and their shape utilizing a specially designed diffusion cell and a scanning electron microscope, respectively. Encapsulation values of the formulations were also determined. The drug was assayed by HPLC method using a C8 column and UV detector at 214 nm.
Results: The results showed that there was no significant difference between the formulations regarding their size, while their encapsulation efficacy significantly differed. The loading of liposomes was increased when incorporated with chitosan. The results indicated that comparing the liposomal formulations, the surface charge increased significantly by increasing the amount of phosphatidylcholine.

Keywords: Insulin; Chitosan; Liposome; Chitosome