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Preparation and characterization of dorzolamide HCl loaded in niosome in order to study the amount of its realese

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Background and Aims: Niosomes have been reported as a possible approach to improve the low corneal penetration and bioavailability characteristics shown by conventional ophthalmic vehicles. The objective of the present research is to investigate the feasibility of using niosomes as carriers for the ophthalmic controlled delivery of dorzolamide HCl as an antiglaucomic drug.
Methods: Niosomal formulations were prepared using span 60 as a surfactant, in the presence of cholesterol and a positive charge inducer stearyl amine (SA) in different molar ratios, by employing a thin film hydration technique. Then niosomal formulation was extruded to change MLV vesicle to LUV and to reduce the vesicle size. Ability of the vesicles to entrap the studied drug was evaluated by determining the entrapment efficiency (%EE) after centrifugation and separation of the formed vesicles. Dynamic light scattering (DLS), as well as particle size analysis were used to study the size of the drug loaded niosomes.
Results: The results showed that type of surfactant, cholesterol content, lipid drug ratio, and presence of SA altered the entrapment efficiency of dorzolamide HCl in niosome. The average size of vesicles was around 300 nm. In vitro drug release results confirmed that niosomal formulations have exhibited a high retention of dorzolamide HCl inside the vesicles, and were slower than that of drug solution. .
Conclusions: the niosomal formulation could be a promising drug delivery system for dorzolamide, with prolonged drug release profiles.

Keywords: Dorzolamide Hcl; Niosomes; Sustained release; Drug delivery