Ocular Drug Deliver and the Importance of Microemulsion as a Potential Delivery System

Fawzia Habib, Mona El-Mahdy, Shaheer Maher

Abstract:

Conventional dosage forms such as eye drops are the most used dosage form by ocular route, in spite of their low bioavailability and the pulsed release of the drug where it is expected that direct application of the drug to the eye will give maximum response; however after instillation of an eye drop, about 70% of the administered volume can be seen to be lost by different factors. For this reason new ocular drug delivery vehicles have been developed in order to minimize the amount of the drug lost from the eye and at the same time provide maximum response with reduced frequency of administration. Among such delivery systems are microemulsions. Microemulsions are a promising dosage form for ophthalmic application because their industrial production and sterilization are relatively simple and inexpensive; they have good thermodynamic stability and inherently provide the capacity to make soluble lipophilic drugs. At the same time, the in vivo results and preliminary studies on healthy volunteers have shown a delayed effect and an increase in the bioavailability of the drug. The proposed mechanism is based on the adsorption of the nanodroplets, representing the internal phase of the microemulsion and acting as drug reservoir, on the cornea and thus increasing the time in which the drug is available for absorption. This review will discuss the important characteristics of ocular delivery systems, factors that reduce drug availability to the eye and methods to improve ocular bioavailability. It will also focus on microemulsions, their preparation methods, their components and their applications as drug carrier for ocular use.

Published In: