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Bilosomes as a novel ocular drug delivery system for acetazolamide: *In vitro* and *in vivo* evaluation

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Acetazolamide (ACZ), a carbonic anhydrase inhibitor, is used to reduce the eye pressure in people suffering from glaucoma. ACZ has limited aqueous solubility and poor corneal permeation. The objective of the present study was to attain enhanced ocular delivery of ACZ *via* its incorporation into bilosomes. ACZ loaded bilosomes were prepared by the thin film hydration technique employing Span 60, cholesterol and different bile salts (sodium cholate, sodium deoxycholate, sodium taurocholate and sodium tauroglycocholate). They were further characterized *via* particle size and zeta potential analysis in addition to transmission electron microscopy. *In vitro* release studies were performed using diffusion bag technique. The developed formulations exhibited high entrapment efficiencies up to 74.23. They were spherical in shape and their sizes were in the nanometric dimensions ranging from 349.8 nm to 734.6 nm with negatively charged zeta potential values (<-43.4 mV). *In vitro* drug release profiles revealed sustained release of the drug up to 8 hours. *In vivo* pharmacodynamic assessment of the optimized ACZ bilosomal formulation, employing male albino rabbits, revealed enhanced and prolonged intraocular pressure lowering effect compared to plain ACZ suspension, marketed ACZ oral tablets as well as marketed dorzolamide eye drops. Furthermore, *in vivo* ocular irritancy test proved the safety of the optimized bilosomal formulation after ocular application.

Biography

Amira Mohsen received her PhD degree in pharmaceutical sciences from Cairo university in 2012. She has her expertise in pharmaceutics and pharmaceutical technology. Her professional interests focus on drug formulation and drug delivery systems. She is currently working as associate professor in pharmaceutical technology department, National Research Centre, Cairo, Egypt. Moreover, she is a member of several projects and has a lot of scientific activities.

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