

DEVELOPMENT AND EVALUATION OF IN SITU GELS CONTAINING ACETAZOLAMIDE MICROSPONGES FOR OPHTHALMIC DELIVERY

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Microsponge drug delivery system is an advanced delivery system that could act as a locally targeted delayed drug release. In this work, we developed microsponges loaded with the anti glaucoma drug, acetazolamide, to enhance therapeutic efficacy and reduce the side effects of oral acetazolamide.

The microsponges were prepared by the quasi emulsion solvent diffusion method. Ethyl cellulose polymer in different proportions with drug was used to prepare the microsponges. Different influencing parameters were evaluated to select the best formulation. The formula S2 with drug to polymer ratio (2:1) showed high entrapment efficiency of about 82% and mean particle size of about 10 μm with polydispersity index (PDI) of 0.22, which are suitable characters for ocular delivery. The best formulation was characterized for surface morphology and in vitro release studies. Three different types of plain in situ gels viz., pluronic F-127 (PF-127), carbopol 934 (CP 934) and gellan gum (GM) were prepared and evaluated for physicochemical properties (pH, gelling capacity, gelation time and rheological properties) to select the suitable one. PF-127 in situ gel formulations were found to have superior characters for ophthalmic administration and were used for the in vivo efficacy studies. These results of in vivo studies indicated that acetazolamide microsponges in situ gel have potential ability for ophthalmic delivery.

1. Morsi, N., Ibrahim, M., Refai, H., El Sorogy, H., 2017. Nanoemulsion-based electrolyte triggered in situ gel for ocular delivery of acetazolamide. *European Journal of Pharmaceutical Sciences* 104, 302-314.