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Formulation and *in vitro* evaluation of ciprofloxacin hydrochloride ocular film

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Background and Aims: Ciprofloxacin hydrochloride is a fluroquinolone antibiotic used in the treatment of bacterial conjunctivitis and corneal ulcer. This study aims at the design and formulation of ciprofloxacin hydrochloride containing ocular film that is capable of keeping its drug within the eye for an extended period of time and releasing the drug in a controlled manner.
Methods: Ciprofloxacin hydrochloride was mixed with various amounts of polymers including HPMC 4000 cps, HEC, CMC, carbomer 940, PVPK-30, PVPK-90, Eudragits RS-PO and RL-PO, 40% PEG 400 as a plastisizer and water, alcohol and acetone as solvents. The solvent casting method was used to prepare the films. Films were made by evaporating solutions to dryness, following by cutting them into 0.785 cm2 pieces. Then, they underwent various tests including appearance, thickness, weight, in-vitro drug release (in NaCl 0.9%), kinetic studies and swelling capacity.
Results: Results showed that cellulosic polymers and carbomer 940 released their drug content too rapidly. However, eudragits were found to be better in this respect. To achive desirable drug release, formulations were coated with different concentrations of ethyl cellulose -containing solutions. The final formulation F42 released 80% of its drug content in a period longer than 6 hours and followed the higuchi kinetic model of drug release. It also swelled twice its weight over 4 hours.
Conclusions: The selected formulation F42 containing eudragit RS-PO as the core polymer and ethyl cellulose as the coat polymer seems to provide appropriate drug release over 6 hours as well as a suitable swellability. Hence, it could be suggested as a useful template for ocular drug delivery.

Keywords: Ocular film; Ciprofloxacin hydrochloride; Eudragit; Ethyl cellulose; Controll release