

The formulation of ocular timolol maleate minitables

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Background and Aims: The aim of this investigation was preparation of ocular sustained release minitables of timolol maleate, as a non selective B blocker, used in treatment of glaucoma.

Methods: Minitables containing 0.05mg Timolol and different amounts of Ethyl cellulose 100cps, Hydroxy propyl methyl cellulose 4000cps, Sodium carboxy methyl cellulose 25000cps, Hydroxy ethyl cellulose, Carbomer 974p, Manitol as a solubilizer and Magnesium stearate as a lubricant were prepared by the direct compression method, using flat-faced 3mm punches. Formulation prepared were evaluated in term of physicochemical tests, including hardness, appearance, weight variation, thickness, friability, hardness, swelling index and drug release in NaCl 0.9% at 32±1°C up to 5 hours. Finally kinetic were conducted using different mathematical models in order to detect the pattern and kinetic of drug release.

Results: Based on the result, the use of HPMC or CMC alone, achieved inappropriate appearance, thickness and hardness. They also lowered hardness and drastically decreased the amount of drug release. When using cellulose polymer in combination along with Carbomer 974p as a hydrophilic polymer, the amount of drug release was well controlled. Among the different combination investigated the use of EC 70% as a filler, along with 4% Carbomer managed to produce in the best result. The presence of manitol in this formulation helped as a solubilizer producing an improved drug release. Also the physicochemical test of minitables were also desirable. In term of kinetic studies Zero-order and Higuchi mathematical models to be the most suitable.

Conclusions: The best formulation contained Timolol 5%, Ethyl cellulose 70%, Manitol 20%, Carbomer 4%, Magnesium stearate 1% with erosion under 1%, good hardness and weight variation and drug release over 95% in NaCl 0.9% at 32±1°C up to 5 hours. Finally the minitables prepared could be found useful as a sustained release ocular drug delivery system for treatment of eye disorders instead of eye drops.

Keywords: Timolol maleate; Ocular minitables; Ethyl cellulose; Carbomer 974p