



Bioadhesive Ophthalmic Inserts for Treatment of Glaucoma: *In Vitro-In Vivo* Evaluation

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SUMMARY. Bioadhesive ophthalmic inserts were prepared using single polymer, namely: hydroxypropyl-methyl cellulose (HPMC), sodium carboxymethyl cellulose (NaCMC), and sodium alginate (SA) in 2% concentration or a mixture of two polymers. The prepared inserts were evaluated *in vitro* for content uniformity, thickness, folding endurance, weight variation, surface pH, swelling behavior, bioadhesion, *in vitro* residence time, and drug release. Inserts were evaluated *in vivo* for intraocular pressure (IOP) lowering effect, *in vivo* ocular irritancy, and precorneal residence time. *In vitro* release study exhibited extended release for 8 h. Inserts based on NaCMC were superior over other inserts with respect to swelling, bioadhesion and extended release. Adding HPMC or NaCMC to SA and adding NaCMC to HPMC improved the characteristics of SA and HPMC inserts, respectively. All inserts showed a significant IOP lowering in normotensive rabbits. SA based inserts showed a stable IOP lowering effect for 5 h.

KEY WORDS: Bioadhesion, Intraocular pressure, Inserts, Glaucoma, Ocular.

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