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Novel Nanostructured Lipid Carrier Based Flurbiprofen Loaded Sodium Alginate Inserts for Ocular Drug Delivery

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***SUMMARY*. The aim of the present study was to develop a novel Flurbiprofen (FLB) loaded nanostructured lipid carrier (NLC) based alginate inserts for treatment of ocular inflammation. 0.3% FLB loaded NLCs were prepared by means of high shear homogenization and afterwards 0.75% sodium alginate was added into these NLCs. Glycerin or PEG 400 at 5% concentration was added to NLCs as plasticizers and by using solvent casting evaporation technique, inserts were developed. Inserts were evaluated for diameter, thickness, weight uniformity, drug content, moisture absorption and moisture loss. Also *in vitro* release and stability studies were performed. The characterization properties of inserts were acceptable for ophthalmic application. The inserts developed with the addition of glycerin ($Ins1_{FLB}$) were found as optimum formulation for FLB *in vitro* release. FLB loaded NLC based inserts developed with sodium alginate and glycerin may be offered as appropriate vehicles for ocular delivery.**

RESUMEN. El objetivo del presente estudio fue desarrollar un nuevo vehículo lipídico nanoestructurado (NLC) de flurbiprofeno (FLB) a base de insertos de alginato para el tratamiento de la inflamación ocular. Se prepararon NLCs cargados con 0,3% de FLB por medio de homogeneización de alta cizalladura y después se agregó 0,75% de alginato de sodio dentro de estos NLCs. Se añadió glicerina o PEG 400 al 5% a los NLCs como plastificantes y se desarrollaron los insertos mediante el uso de la técnica de evaporación del disolvente. Los insertos fueron evaluados por diámetro, espesor, uniformidad de peso, contenido de fármaco, absorción y pérdida de humedad. También se realizaron estudios de liberación y estabilidad *in vitro*. Las propiedades de los insertos fueron aceptables para aplicación oftálmica. Los insertos desarrollados con la adición de glicerol ($Ins1_{FLB}$) resultaron la formulación óptima para la liberación *in vitro* de FLB. Los insertos basados en NLCs cargados de FLB desarrolladas con alginato de sodio y glicerina pueden ser ofrecidos como vehículos apropiados para su aplicación ocular.

KEY WORDS: alginate, flurbiprofen, insert, nanoparticle, nanostructured lipid carrier, ocular.

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