CHAPTER 40

PHARMACY

Doctoral Theses

01. SHARMA (Anil Kumar)
Studies on Ocular Formulations of Selected Nsaid.
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Abstract
(Verified)

Drug delivery can make a big difference in ocular drug treatment. From the drug delivery point of view the eye is very interesting, a small multicompartmental system with various tissues, their boundaries, and fluid flow factors. Currently, topical delivery through eye drops accounts for about 90% of all ophthalmic formulations. However, this delivery mode is very inefficient and in some cases, leads to serious side effects. Only 5% of the drug applied as drops penetrates the cornea and reaches the ocular tissue, whilst the remainder is lost or wasted. Moreover, the application of ophthalmic drops results in varying rates of drug delivery to the ocular tissues, and thus limits their therapeutic efficacy. Therefore, new types of ophthalmic drug delivery systems are highly desirable to increase the delivery efficacy and reduce side effects and to sustain the drug therapeutic effect through control of the rate of delivery. Ocular infections are common during summer and rainy seasons, which results into eye diseases such as conjunctivitis, keratitis, endophthalamitis etc. The corticosteroids are frequently used topically for the treatment of ocular inflammations. Their application is often associated with increase in intraocular pressure, cataract development and risk of infections. COX-2 specific NSAIDs (such as celecoxib), which leave COX-1 unaffected and block only COX-2 may be beneficial for management of diverse ocular inflammations. The present study was an endeavor to formulate and evaluate conventional as well as colloidal systems of celecoxib, a specific cox-2 blocker for treatment of ocular inflammation. The celecoxib is approximately 300 more specific towards cox-2 versus cox-1. The study has encompassed stability studies as well as in vivo behavior of developed formulations. The study embraced development and characterization of particulates and conventional eye drops as under: Poly epsilon caprolactone (PCL) nanoparticles Glyceryl monostearate (GMS) solid lipid nanoparticles Oil drops

Contents

1. Introduction. 2. Overview of biopolymers as carriers of anti-inflammatory agents for treatment of diverse ocular inflammations 3. Efficacy assessment of celecoxib oil drops versus arachidonic acid induced ocular inflammation in rabbits 4. Fabrication and evaluation of lipid nanoparticulates for ocular delivery of a COX-2 inhibitor 5. Biodegradable nanoparticles for topical ocular delivery of a COX-II inhibitor 6. Summary and conclusion. Publications.