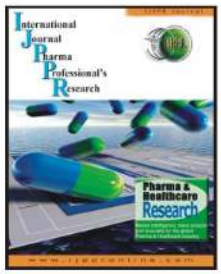
Volume-7, Issue-1, January-2016
Available Online at www.ijppronline.in
International Journal Of Pharma Professional's Research

Review Article

THE USE OF *IN-SITU* HYDROGEL IN OCULAR DRUG DELIVERY



Vikas kumar*, Rasvendra Rajput*,Shekhar Singh

ISSN NO:0976-6723

1. T. M. College of Pharmacy, Teerthanker Mahaveer University, Moradabad (U.P.) 244001

Abstract

Ocular drug delivery has remained as one of the most challenging and interesting task for pharmaceutical scientists. The conventional ocular drug delivery systems like solutions, suspensions, ointments, polymeric insert show drawbacks such as lack patient compliance, increased precorneal elimination, and blurred vision. In situ-forming hydrogels are liquid based upon phase transition in the ocular cul-de-sac to form viscoelastic gel and this provides a response to environmental changes. In the past few years, an impressive number of novel temperature, pH, and ion induced in situ-forming systems have been reported for sustain ophthalmic drug delivery. This review includes effect of polymers, temperature and pH in situ-forming polymeric systems used to achieve prolonged contact time of drugs with the cornea and increase their bioavailability.

Keywords: - : In situ gelling system, hydrogel, change of pH, Polymer

Introduction

Ophthalmic drug delivery is one of the most interesting and challenging endeavors facing the pharmaceutical scientist. The anatomy, physiology, and biochemistry of the eye render this organ highly impervious to foreign substances. A significant challenge to the formulator is to circumvent the protective barriers of the eye without causing permanent tissue damage. Development of newer, more sensitive diagnostic techniques and novel therapeutic agents continue to provide ocular delivery systems with high therapeutic efficacy. The ophthalmic formulation such as solution, suspension, and ointments, available in market shows drawbacks such as increased precorneal elimination, high variability in efficiency, and blurred vision. The major problem with the conventional dosage forms is bioavailability of drug, which was improved ion last three decades by common method i.e. adding viscosity-enhancing agent or mucoadhesive polymers into drug formulation. The goal of pharmacotherapeutics is to treat a disease in a consistent and predictable fashion. An assumption is made that a correlation exists between the concentration of a drug at its intended site of action and the resulting pharmacological effect. The specific aim of designing a therapeutic system is to achieve an optimal concentration of a drug at the active site for the appropriate duration. Ocular disposition and elimination of a therapeutic agent is dependent upon its physicochemical properties as well as the relevant ocular anatomy and physiology. Ophthalmic solutions are available for multidose or single-dose administration in a wide variety of glass and plastic dropper bottles, which deliver drops with a volume between 25 and 70 µL. Upon administration of topically applied eye drops, removal from the eye is rapid because of tear production and the blinking processes occurring simultaneously. The precorneal volume is about 7 µL, but volumes up to 20 to 30 µL can be held in this area before spillage occurs. Instillation of volumes greater than this will result in simply spilling out onto the cheek or rapid loss with the tears through drainage into the nasolachrymal duct. Also, the instilled product is diluted by normal tear production, with tear production rates in man reported as 1 µL/min under resting conditions. In practice, the introduction of any eye drop product, but particularly products causing irritation, is likely to stimulate the tear production rate and increase the rate of drug removal from the eye. The removal of material by dilution is also aided by the blink reflex