Citation on the Research Work

Using an eye drop, only 1–10 % of the drug is absorbed when the majority is removed from the pre-corneal region. The contact time of a dosage form on the cornea is an important factor for ocular drug delivery. The blinking reflex and tear flow leads to naso-lachrymal drainage of drug when introduced in to the eye. This is result a short ocular residence times and low bioavailability which fails to achieve desired therapeutic effect of the drug. To overcome this we have to chosen a vehicle which increases the contact time in the eye. Trimetazidine dihydrochloride has highly soluble and highly permeable so it comes under BCS Class I type drug. Trimetazidine dihydrochloride have a short elimination half life of 5 to 6 h which leads to repeated administration (2-3 times daily). Published reports are not available exactly on topically applied ocular delivery of trimetazidine for extended period of time.Clay minerals have been using a wide range of application in industries due to its easy availability and low cost. They have been commonly used as protective and curative proposes since earliest time. According to the composition and fabrication clay minerals are divided in to several classes. They may be natural or synthetic such as mica, talc, kaolin, montmorillonite, hectorite. Among them montmorillonite has been used in various industries and pharmaceutical fields widely due to its unique characteristics. Montmorillonite is a major component of bentonite and acts multifunctional. It have a large surface area, swelling capacity, high adsorption capacity which contributes to a strong interaction of active drug molecule results sustained release properties. Na-bentonite incorporated trimetazidine ocular film has been developed for the control of ocular pressure on normotensive rabbit eye model. Bentonite incorporated sol-to-gel formulation has been developed for the controlled ocular delivery of trimetazidine. The cytoprotective effect of trimetazidine on carrageenan-induced ocular cell damage in a rat eye model, using hydrogel forming trimetazidine film has also been observed. Present study has also been concentrated on examining the protecting effect of trimetazidine in a glucose-

induced in-vitro cataract model on isolated goat-eye lens after topical administration. Film formulation showed controlled release of drug and thereby extending the ophthalmic permeation for more than 6 h. Permeation has been extended with the decrease of bentonite amount in the film. Sustained trimetazidine delivery has been characterized by the area under the decreased intraocular pressure (IOP) versus time curve after topical administered film formulation. In rabbits treated with film formulation TB3, the peak IOP dropped of almost 30% from the baseline at 240 min and persisted until 360 min and a good in vitro-in vivo correlation has also been established. Prominent acute inflammation has been produced in the carrageenan-induced untreated eye, whereas the absence of ocular inflammation has been noticed in the previously sol-treated eye even after carrageenan injection. HPMC-poloxamer-based formulation exhibited stronger binding affinity (5.13 kcal/mol) in the presence of bentonite rather than its absence (3.99 kcal/mol), resulting in a stable and sustained effect. Development of bentonite incorporated trimetazidine ophthalmic delivery could be used for controlling of ocular protection.

Key Words: Trimetazidine, bentonite, ophthalmic drug delivery, ocular protection

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