Development, characterization and evaluation of ocular gel (*in situ*) of aceclofenac for safe and effective ocular delivery

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Aim: The study was intended to develop *in situ* gel of drug Aceclofenac (ACE) for its effective and safe ocular delivery at the inflammatory sites.

Summary of the problem: In the treatment of inflammatory conditions prevailing in eye, multiple strategies have been employed like steroids and non-steroidal anti-inflammatory agents. But their use is restricted due to their drawbacks like low drug permeation and retention, low drug availability, local irritation and stinging effect at the affected site in the eye.

Methodology & Theoretical Orientation: ACE complex with β-cyclodextrin (B- cd) was prepared in the ratio (1:1) and incorporated into a temperature sensitive carrier system. It consists of poloxamer (20 %), benzalkonium chloride (0.01 %), alpha-glyceryl phosphorylcholine (1 %) and sodium chloride (0.9 %), and forms *in situ* gel at 37 °C due to the presence of poloxamer.

Observations: FTIR results confirmed the drug-excipient compatibility and successful development of the carrier system. The viscosity measurements of the prepared solution and *in situ* gel have been carried out with the desirable results of Newtonian and non-Newtonian flow respectively. In vitro drug release studies proved the sustained release of the prepared formulations as compared to the marketed formulations. The anti- inflammatory and analgesic animal models revealed the supremacy of the prepared formulations over the marketed formulations with increased ocular bioavailability of the drug at the target site. Ocular irritancy studies performed on rabbit eye model proved the safety and non-irritancy of the prepared formulation. Moreover, the formulation was found stable for the period of six months.

Summary & Conclusion: The current findings provide the lead for the development of an effective ocular formulation of ACE with sustained drug release and substantial stability.

Biography: Supriya Verma has been engaged in experimental laboratory work that includes formulation development, in vitro characterization and in vivo evaluation of the novel drug delivery based formulations i.e., liposomes, niosomes, solid lipid nanoparticles, nanostructured lipid carriers, etc. Her area of research is based on systematic design and development of nanostructured delivery system of Aceclofenac and Risedronate. In the last four years of research experience, she has got wonderful exposure on topical and oral drug delivery systems in an industry (Panacea Biotech, Lalru) as well as in an academic institute (University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh). She has not only involved in research but also undertaking teaching of Undergraduate and Postgraduate classes. Moreover, she is having collaboration with medical institutes i.e., PGIMER, Chandigarh and AIIMS, New Delhi for the assistance of clinical studies over there. Also she is writing research articles and book chapters related to her professional domain. She has attended various National as well as International level conferences and been awarded with six best paper awards in the last four years.

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