Formulation and In Vitro Evaluation of Push Pull Osmotic Pump Tablets of Mefenamic acid for Oral Controlled Drug Delivery

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Abstract

The present study focused on the preparation of push pull osmotic drug delivery system for a poorly insoluble drug of non steroidal anti-inflammatory category. The main aim was to reduce the dosing frequency and to provide the controlled release of drug for once-a-day drug delivery system with zero order drug release profile with applying drug release kinetic modelling. The push pull osmotic tablets were prepared by direct compression method. the drug layer consists of drug, osmotic agent, suspension agent and in push layer extender, osmotic agent. The coating was carried out by cellulose acetate (CA) and plasticizer was used as propylene glycol. This study evaluates that regardless of the drug properties which do not significantly affect the drug delivery, the release kinetics was mainly controlled by some factors as, the coating membrane, the osmotic agent proportion, the drug layer polymer proportion and proportion of osmogent and extender in push layer the influence of each factor was investigated defining their acceptability range. Results showed tablets made by PEO100K and diluents used in drug layer and Carbopol 934 and sodium chloride in push layer with 5%,10%,20% of CA coating, and 0.8mm of orifice diameter. Results, showed the use of suspension agent in drug layer affects the drug release. The formulation batch F14 was taken as ideal optimized batch and it follows the zero order drug release. On the basis of results the effect of polymer concentration in drug

layer, coating and osmogent amount was tested and promising results were found. The drug release was independent of pH. The release kinetics followed the Zero order model.