

Preparation and Evaluation of Ketoprofen Nanosuspension Using Solvent Evaporation Technique

Abstract

The effective surface area of drug particle is increased by a reduction in the particle size. Since dissolution takes place at the surface of the solute, the larger the surface area, the further rapid is the rate of drug dissolution. Ketoprofen is class II type drug according to (Biopharmaceutics Classification System BCS) with low solubility and high permeability. The aim of this investigation was to increase the solubility and hence the dissolution rate by the preparation of ketoprofen nanosuspension using solvent evaporation method. Materials like PVP K30, poloxamer 188, HPMC E5, HPMC E15, HPMC E50, Tween 80 were used as stabilizers in preparation of different formulas of Ketoprofen nanosuspensions. These formulas were evaluated for particle size, entrapment efficiency of drug (EE), effect of stabilizer type, effect of stabilizer concentration and in-vitro dissolution studies. All of the prepared Ketoprofen nanosuspensions formulas showed a particle size result within Nano range. The average particle size of Ketoprofen nanosuspensions formulas was observed from 9.4 nm to 997 nm. Entrapment efficiency was ranged from 79.23% to 95.41 %. The in vitro dissolution studies showed a significant ($p < 0.01$) enhancement in dissolution rate of nanosuspension formulas

compared to pure drug (drug alone) and physical mixture (drug and stabilizer). The results indicate the suitability of solvent evaporation method for Ketoprofen with improved in vitro dissolution rate and thus perhaps enhance fast onset of action for drug.

Keywords: Ketoprofen, Nanosuspension, Particle size, Dissolution rate