Preparation and Evaluation of Self-nanoemulsifying Tablets of Carvedilol

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Abstract

The purpose of this study was to combine the advantages of self-nanoemulsifying drug delivery systems and tablets as a conventional dosage form emphasizing the excipients’ effect on the development of a new dosage form. Systems composed of HCO-40, Transcutol® HP, and medium-chain triglyceride were prepared. Essential properties of the prepared systems regarding carvedilol solubility, a model drug, and self-emulsification time were determined. In order to optimize self-nanoemulsifying drug delivery systems (SNEDDS), formulation dispersion–drug precipitation test was performed in the absence and presence of cellulosic polymers. Furthermore, SNEDDS was loaded onto liquisolid powders. P-glycoprotein (P-gp) activity of the selected SNEDDS was tested using HCT-116 cells. Carvedilol showed acceptable solubility in the selected excipients. It also demonstrated improvement in the stability upon dilution with aqueous media in the presence of cellulosic polymers. Use of granulated silicon dioxide improved the physical properties of liquisolid powders containing SNEDDS. It improved the compressibility of the selected powders and the tested SNEDDS showed marked P-gp inhibition activity. Prepared self-nanoemulsifying tablet produced acceptable properties of immediate-release dosage forms and expected to increase the bioavailability of carvedilol.

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