

Solubility Enhancement of Simvastatin Through Development of Hydroxypropyl Beta-Cyclodextrin Based Microparticulate System and its *In Vitro* Evaluation

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SUMMARY. This study was performed to increase solubility of simvastatin by using solid dispersion method. In this technique polymer 3-hydroxy propyl beta-cyclodextrin (HPBCD) was used. Solid dispersion was formed by using solvent evaporation method. The FTIR-spectra of formulations confirmed the complex formation between simvastatin and HPBCD. The DSC (differential scanning calorimetry) and XRD (X-ray diffractometry) results showed no endothermic and characteristic peaks of simvastatin were noted. This study clearly revealed that change in crystalline nature of simvastatin to amorphous form. Release kinetics, aqueous solubility, and dissolution profiles were greatly increased by this technique as compared to drug alone.

RESUMEN. Este estudio se realizó para aumentar la solubilidad de la simvastatina mediante el método de dispersión sólida. En esta técnica se usó el polímero 3-hidroxipropil beta-ciclodextrina (HPBCD). La dispersión sólida se formó usando un método de evaporación del disolvente. Los espectros FTIR de formulaciones confirmaron la formación compleja entre simvastatina y HPBCD. Los resultados de DSC (calorimetría diferencial de barrido) y XRD (difracción de rayos X) no mostraron picos endotérmicos y característicos de simvastatina. Este estudio reveló claramente el cambio en la naturaleza cristalina de la simvastatina a la forma amorfa. La cinética de liberación, la solubilidad acuosa y los perfiles de disolución aumentaron considerablemente con esta técnica en comparación con el fármaco solo.

KEY WORDS: bioavailability, simvastatin, solid dispersion, solubility, solvent evaporation.

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