Komparasi Laju Disolusi antara Dispersi Padat Glimepirid-PEG 6000-Poloxamer 188 dengan Kokristal Glimepirid-Nikotinamida dalam Sediaan Tablet = Comparison Dissolution Rate between Glimepiride-PEG 6000-Poloxamer 188 Solid Dispersion and Co-Crystal of Glimepiride-Nicotinamide in Tablets

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Abstrak

Glimepirid diklasifikasikan sebagai obat dalam sistem klasifikasi biofarmasetika kelas II yang memiliki kelarutan rendah dan permeabilitas tinggi. Penelitian ini dilakukan dengan memformulasikan dispersi padat menggunakan PEG 6000 dan Poloxamer 188 sebagai polimer dengan perbandingan bobot 1:2; dibandingkan dengan kokristal dari glimepirid menggunakan nikotinamid dengan perbandingan molar 1:2. Penelitian ini bertujuan membandingkan efisiensi disolusi tablet dipersi padat glimepirid dengan tablet kokristal glimepirid. Dispersi padat disiapkan dengan metode peleburan dan kokristal disiapkan dengan metode solvent drop grinding. Dispersi padat dan kokristal dikarakterisasi menggunakan Fourier Transform Infrared Spectroscopy (FTIR), Scanning Electron Microscopy (SEM), difraksi sinar-X, dan kadar air. Formulasi tablet dievaluasi untuk persyaratan kekerasan tablet, keregasan tablet, kandungan obat, waktu hancur, dan efisiensi disolusi. Peningkatan disolusi paling tinggi terjadi pada formulasi tablet dispersi padat dengan perbandingan glimepirid-PEG 6000-Poloxamer 188 (1:1:1) dengan efisiensi disolusi mencapai 3,52 kali tablet glimepirid murni. Dari hasil penelitian ini disimpulkan bahwa tablet yang mengandung dispersi padat dan kokristal glimepirid mampu meningkatkan laju disolusi dibandingkan tablet glimepirid murni.

Glimepiride is classified as a BCS class II drug which has low solubility and high permeability. An attempt has been made to increase the solubility of this model drug by formulating solid dispersion using PEG 6000 and Poloxamer 188 as polymer with 1:2 weight ratio and compared with co-crystal of glimepiride using nicotinamide as polymer with 1:2 molar ratio. This study aims at comparing the dissolution eficiency of solid dispersion and co-crystal in tablets. The solid dispersions was prepared by fusion method and co-crystal was prepared by solvent drop grinding method. Solid dispersions and co-crystal were evaluated for Fourier Transform Infrared Spectroscopy, Scanning Electron Microscopy, X-Ray Difraction, and moisture content. Tablet formulations were evaluated for various pharmaceutical characteristics viz. hardness, % friability, weight variation, drug content, disintegration time, and in vitro dissolution profiles. Solid dispersion tablet with containing drug is glimepiride-PEG 6000-Poloxamer 188 (1:1:1) gives best dissolution eficiency up to 3,52 folds compared to pure glimepiride tablet. In conclusion, solid dispersion tablet and co-crystal tablet of glimepirid could increase dissolution eficiency of pure glimepirid tablet.