ABSTRAK

Ketoprofen merupakan obat golongan BCS kelas II yang memiliki kelarutan rendah dan permeabilitas tinggi sehingga menyebabkan laju disolusi dan bioavailabilitasnya kurang optimal. Salah satu upaya untuk meningkatkan disolusi ketoprofen adalah melalui pembentukan dispersi padat menggunakan pembawa hidrofilik HPMC dan PEG-6000 dengan metode *solvent evaporation.* Penelitian ini bertujuan untuk mengetahui pengaruh dispersi padat dibanding campuran fisik dan variasi rasio HPMC dan PEG-6000 terhadap profil dan efisiensi disolusi ketoprofen. Dispersi padat dibuat dengan variasi rasio HPMC : PEG-6000 sebesar 2:6; 4:4; dan 6:2, sedangkan campuran fisik dengan komposisi yang sama digunakan sebagai pembanding. Evaluasi meliputi hasil rendemen, validasi metode analisis spektrofotometri UV, dan uji disolusi menggunakan alat disolusi tipe I (keranjang) dalam medium dapar fosfat pH 6,8. Parameter yang diamati meliputi profil dan efisiensi disolusi. Data dianalisis menggunakan SPSS versi 26 melalui uji *Shapiro-Wilk, Levene's Test, Independent t-test, One-Way ANOVA,* dan uji lanjut *Post-Hoc Tukey* dengan taraf signifikansi 95%.

Hasil penelitian menunjukkan bahwa seluruh formula dispersi padat menghasilkan rendemen lebih dari 60% dan metode analisis memenuhi parameter validasi meliputi spesifisitas, linearitas, akurasi, presisi, LOD dan LOQ. Dispersi padat formula 1 (HPMC : PEG-6000 = 2:6) menghasilkan profil disolusi dan nilai DE tertinggi dibandingkan formula lainnya. Hasil *Independent t-test* menunjukkan terdapat perbedaan signifikan antara campuran fisik dan dispersi padat pada formula 1 ($p<0,05$), sedangkan formula 2 dan 3 tidak menunjukkan perbedaan yang signifikan ($p>0,05$). Hasil *One-Way ANOVA* yang dilanjutkan dengan uji *Post-Hoc Tukey* menunjukkan bahwa DP1 berbeda signifikan terhadap DP2 dan DP3, sedangkan DP2 dan DP3 tidak berbeda signifikan ($p>0,05$).

Berdasarkan hasil tersebut, dapat disimpulkan bahwa dispersi padat berpengaruh terhadap parameter disolusi ketoprofen dibandingkan campuran fisik. Variasi rasio HPMC dan PEG-6000 juga berpengaruh terhadap efisiensi disolusi ketoprofen dalam sistem dispersi padat.

Kata kunci: Ketoprofen, Dispersi Padat, HPMC, PEG-6000, *Solvent Evaporation*

ABSTRACT

Ketoprofen is classified as a Biopharmaceutics Classification System (BCS) Class II drug, characterized by low solubility and high permeability, resulting in a limited dissolution rate and suboptimal bioavailability. One approach to enhance the dissolution of ketoprofen is the preparation of a solid dispersion using hydrophilic carriers, hydroxypropyl methylcellulose (HPMC) and polyethylene glycol 6000 (PEG-6000), through the solvent evaporation method. This study aimed to evaluate the effect of solid dispersion compared with physical mixtures and the effect of different HPMC and PEG-6000 ratios on the dissolution profile and dissolution efficiency of ketoprofen in a solid dispersion system. Solid dispersions were prepared using HPMC : PEG-6000 ratios of 2:6; 4:4; and 6:2, while physical mixtures with identical compositions were prepared as controls. The formulation were evaluated for percentage yield, validation of the UV spectrophotometric analytical method, and dissolution testing using USP apparatus I (basket method in phosphate buffer pH 6,8). Dissolution performance was assessed based on the cumulative percentage dissolved (%Qkum) and dissolution efficiency (DE). Statistical analysis was performed using SPSS version 26, including the Shapiro-Wilk test, Levene's test, Independent t-test, One-Way ANOVA, and Tukey's post-hoc test at a 95% confidence level.

The result showed that all solid dispersion formulations achieved percentage yields above 60%, and the analytical method fulfilled the validation parameters of specificity, linearity, accuracy, precision, limit of detection (LOD), and limit of quantification (LOQ). Solid dispersion formula 1 (HPMC : PEG-6000 = 2:6) exhibited the highest dissolution profile and dissolution efficiency among all formulations. The independent t-test revealed a significant difference between the physical mixture and solid dispersion in formula 1 ($p<0.05$), whereas no significant differences were observed in formula 2 and 3 ($p>0.05$). One-Way ANOVA followed by Tukey's post-hoc test demonstrated that DP1 differed significantly from DP2 and DP3, while no significant difference was found between DP2 and DP3 ($p>0.05$).

In conclusion, the solid dispersion system significantly improved the dissolution parameters of ketoprofen compared with the corresponding physical mixtures. Furthermore, variation in the HPMC and PEG-6000 ratio significantly influenced the dissolution efficiency of ketoprofen in the solid dispersion system.

Kata kunci: *Ketoprofen, Solid Dispersion, HPMC, PEG-6000, Solvent Evaporation*