# INTISARI

HASTUTI, CHAESTI SETYO, 2013, OPTIMASI FORMULA TABLET LEPAS LAMBAT TRAMADOL HCL DENGAN KOMBINASI MATRIKS MUKOADHESIF PVP DAN XANTHAN GUM SECARA *SIMPLEX LATTICE DESIGN*, SKRIPSI, FAKULTAS FARMASI, UNIVERSITAS SETIA BUDI, SURAKARTA.

Tramadol HCl merupakan sintetik opioid kelompok sikloheksanol yang bertindak sebagai analgesik. Obat ini digunakan untuk pengobatan nyeri hebat baik akut maupun kronik serta nyeri pasca pembedahan. Untuk meningkatkan kenyamanan dan kepatuhan pasien, maka tramadol HCl dibuat dalam sediaan lepas lambat. Sediaan ini dirancang untuk melepaskan obat ke dalam tubuh secara bertahap atau perlahan agar pelepasannya lebih lama dan memperpanjang aksi obat. Pada penelitian ini tablet lepas lambat tramadol HCl dikombinasi dengan matriks mukoadhesif PVP dan xanthan gum.

Penelitian ini dibuat dalam empat formulasi antara lain: formula kontrol (tanpa matriks), F I (25% PVP : 75% xanthan gum), F II (50% PVP : 50% xanthan gum), dan F III (75% PVP : 25% xanthan gum). Tablet dibuat dengan granulasi kering dan dicetak dengan bobot tablet 250 mg. Granul dan tablet yang terbentuk dilakukan pengujian sifat fisik granul dan tablet. Penentuan formula optimum menggunakan metode *Simplex Lattice Design* (SLD) dengan *Software Design Expert 8.0.6.* Parameter yang digunakan yaitu: waktu alir, kekerasan tablet, kerapuhan tablet, dan disolusi tablet. Hasil teoritis dan percobaan formula optimum dianalisis dengan menggunakan uji t.

Formula optimum tablet lepas lambat tramadol HCl kombinasi matriks mukoadhesif PVP dan xanthan gum secara *Simplex Lattice Design* diperoleh dengan proporsi PVP 55,031% dan xanthan gum 44,969%. Pola pelepasan tramadol HCl pada formula optimum mengikuti mekanisme difusi dan kinetika orde nol. Respon sifat fisik formula optimum dari hasil prediksi dan percobaan menunjukkan tidak ada beda signifikan.

Kata kunci: tramadol HCl, lepas lambat, mukoadhesif, PVP, xanthan gum, SLD

## ABSTRACT

HASTUTI, CHAESTI SETYO, 2013, OPTIMIZATION SUSTAINED RELEASE TABLET FORMULA OF TRAMADOL HCL WITH PVP AND XANTHAN GUM MUCOADHESIVE MATRIX COMBINATION BY SIMPLEX LATTICE DESIGN, THESIS, PHARMACEUTICAL FACULTY, SETIA BUDI UNIVERSITY, SURAKARTA.

Tramadol HCl is a synthetic opioid of cyclohexanol group which acts as an analgesic. This medicine is used to treat severe pain as well as acute and chronic, and post- surgical pain. To improve the comfort and compliance of patient, therefore tramadol HCl is made in sustained release tablet. It is designed to release the drug into body gradually or slowly to lengthen the release and prolong of drug action. In this study, sustained release tablet of tramadol HCl was combined with PVP and xanthan gum mucoadhesive matrix.

This study was made in four formulas, they were: control formula (without the matrix), F I (25% PVP : 75% xanthan gum), F II (50% PVP : 50% xanthan gum), and F III (75% PVP : 25% xanthan gum). The tablets were made by dry granulation and compressed to 250 mg weight of tablet. The obtained granules and tablets were tested for the physical properties. The properties determination of the optimum formula used Simplex Lattice Design method (SLD) with Software Design Expert 8.0.6. The parameters used were: flowing time, hardness, friability, and disolution. The experimental results and the theoretical optimum formula were analyzed using t-test.

The optimum formula sustained release tablet of tramadol HCl with PVP and xanthan gum mucoadhesive matrix combination by *Simplex Lattice Design* was obtained in proportion of 55,031% PVP and 44,969% xanthan gum. A pattern of tramadol HCl release on the optimum formula followed diffusion mechanism and zerro orde kinetic. The response of physical properties of optimum formula was obtained from prediction result and examination showed that there was not different significant.



Keyword: tramadol HCl, sustained release, mucoadhesive, PVP, xanthan gum, SLD