

ABSTRAK

Levofloksasin merupakan pengembangan dari florokuinolon yang memiliki aktivitas antibakteria dengan spektrum luas. Salah satu penggunaan levofloksasin adalah untuk terapi infeksi *Helicobacter pylori* (*H. pylori*) pada mukosa lambung. Penelitian ini bertujuan untuk 1) mengidentifikasi pengaruh proporsi matriks *mucoadhesive* terhadap sifat fisik tablet dan 2) memperoleh formula optimum tablet *gastroretentive mucoadhesive* levofloksasin.

Tablet dibuat dengan metode granulasi basah dengan menggunakan kombinasi *xanthan gum* dan *guar gum* sebagai matriks *gastroretentive mucoadhesive*. Kombinasi *xanthan gum* dan *guar gum* diharapkan mampu memberikan respon optimum pada kekuatan *mucoadhesive* dan pelepasan obat diperlambat (*sustained release*). Optimasi formula dirancang menggunakan metode *Simplex Lattice Design* dalam *software Design Expert* versi 11. Evaluasi tablet secara *in vitro* meliputi keragaman bobot, kekerasan tablet, kerapuhan tablet, *swelling index*, kekuatan *mucoadhesive*, dan uji disolusi. Formula optimum diverifikasi menggunakan metode analisis *One Sample T-test*.

Hasil penelitian menunjukkan bahwa kombinasi *xanthan gum* dan *guar gum* memberikan pengaruh signifikan terhadap kekerasan, kerapuhan, *swelling index*, kekuatan *mucoadhesive*, dan disolusi obat ($p\text{-value} < 0,05$). Proporsi optimum *xanthan gum* (23,53% b/b) dengan *guar gum* (26,47%b/b) memberikan sifat sinergis dalam meningkatkan kekuatan *mucoadhesive* dan memberikan profil pelepasan obat diperlambat.

Kata kunci : levofloksasin, *gastroretentive mucoadhesive*, *xanthan gum*, *guar gum*.

ABSTRACT

Levofloxacin is a derivative form of the fluoroquinolone antimicrobials which has broad-spectrum antibacterial activity. Levofloxacin is used for *Helicobacter pylori* (*H. pylori*) infection treatment in the gastric mucosa. The aims of this study were 1) to identify the influence of the matrix proportion on tablet's physical properties and 2) to obtain an optimum formula of gastroretentive mucoadhesive levofloxacin tablet.

The tablet was made by wet granulation method using a combination of *xanthan gum* and *guar gum* as mucoadhesive gastroretentive matrix. The combination of *xanthan gum* and *guar gum* is expected to provide an optimum response to mucoadhesive strength and sustained release dissolution profile. Formula optimization was designed based on *Simplex Lattice Design* method using Design Expert version 11 software. In vitro evaluation of tablets included weight variation, hardness, friability, swelling index, mucoadhesive strength, and dissolution test. The optimum formula was verified by *One Sample T-test* analysis.

The results showed that the combination of *xanthan gum* and *guar gum* significantly influence the hardness, the friability, the swelling index, the mucoadhesive strength, and drug dissolution characteristic ($p\text{-value} < 0.05$). The optimum proportion of *xanthan gum* (23.53% b/b) with *guar gum* (26.47% b/b) provided synergistic properties in increasing mucoadhesive strength and optimize the sustained release drug dissolution profile.

Key word: levofloxacin, gastroretentive mucoadhesive, *xanthan gum*, *guar gum*