FORMULASI DAN EVALUASI TABLET METOCLOPRAMIDE HCl *GASTRORETENTIVE HIGH DENSITY* DENGAN INTI *ZINC OXIDE*

Salsabila Intan Mahara
Program Studi Farmasi

ABSTRAK

Latar belakang: *Oral drug delivery system* (ODDS) konvensional memiliki permasalahan penyerapan yang buruk, sehingga mengakibatkan bioavailabilitas yang rendah. Dikembangkan ODDS non-konvensional, salah satunya sistem lepas lambat (*susteined release*) dengan mekanisme GRDDS (*Gastroretentive drug delivery system*). *High density system* merupakan jenis GRDDS yang menahan obat di lipatan antrum lambung, sehingga cocok untuk obat yang diabsorpsi secara cepat dari GIT. Metoclopramide HCl diabsrobsi secara cepat dari GIT dengan frekuensi pemberian pada pasien gastroparesis diabetik 5mg 4 kali sehari, yang meningkatkan ketidakpatuhan pasien.

Tujuan: Mengetahui kemampuan metoclopramide HCl untuk diformulasikan menjadi tablet *gastroretentive high density*. Mengetahui pengaruh konsentrasi inti *zinc oxide* terhadap hasil evaluasi fisik dan profil pelepasan metoclopramide HCl *gastroretentive high density*.

Metode: Penelitian ini merupakan penelitian eksperimental, dengan variabel bebas konsentrasi inti *zinc oxide* (2%; 4%; 6%; 8%; dan 10%) serta variabel terikat berupa hasil evaluasi fisik dan profil pelepasan tablet. Penelitian dilakukan dengan formulasi tablet metoclopramide HCl *high density*, evaluasi granul, dan evaluasi tablet *high density*.

Kesimpulan: Metoclopramide HCl dapat diformulasikan sebagai tablet *gastroretentive high density*. Variasi konsentrasi *zinc oxide* sebagai inti tablet *high density* memberikan perbedaan signifikan terhadap hasil evaluasi fisik kerapuhan tablet, namun tidak memberikan perbedaan signifikan terhadap profil pelepasan tablet formula 1 hingga formula 5.

Kata kunci: *ODDS, GRDDS, evaluasi fisik, profil pelepasan*

FORMULATION AND EVALUATION OF GASTRORETENTIVE HIGH-DENSITY METOCLOPRAMIDE HCL TABLETS USING ZINC OXIDE CORE

Salsabila Intan Mahara
Pharmacy Program

ABSTRACT

Background: Conventional oral drug delivery systems (ODDS) often suffer from poor *absorption*, resulting in low bioavailability. As an alternative, non-conventional ODDS have been developed, including sustained release systems utilizing the Gastroretentive Drug Delivery System (GRDDS) mechanism. The high-density system is a type of GRDDS that retains the drug within the folds of the gastric antrum, making it suitable for drugs that are rapidly absorbed in the gastrointestinal tract (GIT). Metoclopramide HCl is rapidly absorbed from the GIT and is typically administered to diabetic gastroparesis patients at a dosage of 5 mg four times a day, which may lead to poor patient compliance.

Objective: To evaluate the feasibility of formulating metoclopramide HCl into a gastroretentive high-density tablet, and to assess the effect of varying zinc oxide core concentrations on the physical properties and release profile of the tablet.

Methods: This experimental study used different concentrations of zinc oxide core (2%, 4%, 6%, 8%, and 10%) as the independent variable, while the dependent variables were the physical evaluation outcomes and the drug release profile. The study included the formulation of metoclopramide HCl high-density tablets, granule evaluation, and physical evaluation of the gastroretentive high-density tablets.

Conclusion: Metoclopramide HCl can be formulated as a gastroretentive high-density tablet. Variations in zinc oxide concentration significantly affected the tablet's physical characteristic of friability but did not produce significant differences in the drug release profiles among formulas 1 to 5.

Keywords: *ODDS, GRDDS, physical evaluation, release profile*