



## Antiulcer Effect of Gastroretentive Spherical Matrices of Alginate-Chitosan Containing Ranitidine HCl

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**Abstract : Background:** Ranitidine hydrochloride (RHCl) has short biological half life and poor bioavailability, hence, the treatment of gastric ulcer with RHCl conventional dosage form is less effective. Therefore, it is necessary to prepare and evaluate the antiulcer effect of gastroretentive spherical matrices of Alginate-Chitosan(Alg-Ch) containing RHCl.

**Purpose:** The purpose of this study was to prepare and evaluate antiulcer effect of gastroretentive spherical matrices of Alg-Ch containing RHCl.

**Methods:** The gastroretentive spherical matrices of Alg-Ch containing RHCl were prepared by using an Alg:Ch ratio of 1:1. The antiulcer effect was evaluated by two methods, i.e., pylorus ligation-induced ulcer and HCl-induced ulcer methods. In the pylorus ligation induced ulcer method, parameters of gastric secretion (volume, pH, and free and total acidity) were determined. In the HCl-induced ulcer method, one hour after induction, the rats were given gastroretentive spherical matrices of Alg-Ch containing RHCl (once a day) for 3 days. RHCl conventional tablet was used as standard to comparison. Gastric ulcers were evaluated by macroscopic and microscopic observation for both methods.

**Results:** In the pylorus ligation-induced ulcer method, gastroretentive spherical matrices of Alg-Ch containing RHCl showed significant decrease in gastric juice volume, total acidity and free acidity. While, pH of gastric juice was increased. The number of gastric ulcers and ulcer inhibition in the rats received gastroretentive spherical matrices of Alg-Ch containing RHCl were 0.33 and 89.46% compared to rats received RHCl tablet which were 3.00 and 99.46%. In the HCl-induced ulcer method, the number of gastric ulcer in the rats that received gastroretentive spherical matrices of Alg-Ch containing RHCl was zero with curative ratio of 100% after 3 days treatment, while the number of gastric ulcer in rats that received RHCl conventional tablet was 2,88 with curative ratio of 75.33%. The result of histopathology examination did not show ulcer of the gastric mucosa in the test group rats compared to the rats that received conventional RHCl tablet still had ulcer.

**Conclusion:** It can be concluded from these results that the antiulcer effect of gastroretentive spherical matrices of Alg-Ch containing RHCl is more effective than conventional tablet of RHCl.

**Keywords:** Alginate-Chitosan, spherical matrices, ranitidineHCl, antiulcer.