

Optimization of Gastro-Retentive Matrix Formulation and Its Gamma Scintigraphic Evaluation

Authors : Swapnila V. Shinde, Hemant P. Joshi, Sumit R. Dhas, Dhananjaysingh B. Rajput

Abstract : The objective of the present study is to develop hydro-dynamically balanced system for atenolol, β -blocker as a single unit floating tablet. Atenolol shows pH dependent solubility resulting into a bioavailability of 36%. Thus, site specific oral controlled release floating drug delivery system was developed. Formulation includes novice use of rate controlling polymer such as locust bean gum (LBG) in combination of HPMC K4M and gas generating agent sodium bicarbonate. Tablet was prepared by direct compression method and evaluated for physico-mechanical properties. The statistical method was utilized to optimize the effect of independent variables, namely amount of HPMC K4M, LBG and three dependent responses such as cumulative drug release, floating lag time, floating time. Graphical and mathematical analysis of the results allowed the identification and quantification of the formulation variables influencing the selected responses. To study the gastrointestinal transit of the optimized gastro-retentive formulation, in vivo gamma scintigraphy was carried out in six healthy rabbits, after radio labeling the formulation with ^{99m}Tc . The transit profiles demonstrated that the dosage form was retained in the stomach for more than 5 hrs. The study signifies the potential of the developed system for stomach targeted delivery of atenolol with improved bioavailability.

Keywords : floating tablet, factorial design, gamma scintigraphy, antihypertensive model drug, HPMC, locust bean gum

Conference Title : ICBPS 2014 : International Conference on Biomedicine and Pharmaceutical Sciences

Conference Location : Paris, France

Conference Dates : May 19-20, 2014