

Development, Optimization and Characterization of Gastroretentive Multiparticulate Drug Delivery System

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Abstract : Current study illustrates the formulation of floating microspheres for purpose of gastroretention of Dipyridamole which shows pH dependent solubility, with the highest solubility in acidic pH. The formulation involved hollow microsphere preparation by using solvent evaporation technique. Concentrations of rate controlling polymer, hydrophilic polymer, internal phase ratio, stirring speed were optimized to get desired responses, namely release of Dipyridamole, buoyancy of microspheres, entrapment efficiency of microspheres. In the formulation, the floating microspheres were prepared by using ethyl cellulose as release retardant and HPMC as a low density hydrophilic swellable polymer. Formulated microspheres were evaluated for their physical properties such as particle size and surface morphology by optical microscopy and SEM. Entrapment efficiency, floating behavior and drug release study as well the formulation was evaluated for in vivo gastroretention in rabbits using gamma scintigraphy. Formulation showed 75% drug release up to 10 hr with entrapment efficiency of 91% and 88% buoyancy till 10 hr. Gamma scintigraphic studies revealed that the optimized system was retained in the gastric region (stomach) for a prolonged period i.e. more than 5 hr.

Keywords : Dipyridamole microspheres, gastroretention, HPMC, optimization method

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