World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:14, No:12, 2020

Development of Site-Specific Colonic Drug Delivery System (Nanoparticles) of Chitosan Coated with pH Sensitive Polymer for the Management of Colonic Inflammation

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Abstract : Background: The use of multiparticulate drug delivery systems in preference to single unit dosage forms for colon targeting purposes dates back to 1985 when Hardy and co-workers showed that multiparticulate systems enabled the drug to reach the colon quickly and were retained in the ascending colon for a relatively long period of time. Methods: Site-specific colonic drug delivery system (nanoparticles) of 5-ASA were prepared and coated with pH sensitive polymer. Chitosan nanoparticles (CTNP) bearing 5-Amino salicylic acid (5-ASA) were prepared, by ionotropic gelation method. Nanoparticulate dosage form consisting of a hydrophobic core enteric coated with pH-dependent polymer Eudragit S-100 by solvent evaporation method, for the effective delivery of drug to the colon for treatment of ulcerative colitis. Results: The mean diameter of CTNP and ECTNP formulations were 159 and 661 nm, respectively. Also optimum value of polydispersity index was found to be 0.249 [count rate (kcps) was 251.2] and 0.170 [count rate (kcps) was 173.9] was obtained for both the formulations respectively. Conclusion: CTNP and Eudragit chitosan nanoparticles (ECTNP) was characterized for shape and surface morphology by scanning electron microscopy (SEM) appeared to be spherical in shape. The in vitro drug release was investigated using USP dissolution test apparatus in different simulated GIT fluids showed promising release. In vivo experiments are in further proceeding for fruitful results.

Keywords : colon targeting, nanoparticles, polymer, 5-amino salicylic acid, edragit
Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development
Conference Location : Chicago, United States
Conference Dates : December 12-13, 2020