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Development and characterization of terbutaline sulphate microsponge and its colonic delivery by compression coated tablets

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Abstract

The objective of this study was to develop compression coated tablets (CCT) of terbutaline sulphate (TBS) microsponges for potential colonic drug delivery with improved gastric resistance and pulsatile release based on coatings of powder blends of the swelling polymer HPMC K100M and the extended release polymer EC. 32 full factorial design was employed to study the effect of drug:polymer ratio and percentage of magnesium stearate on particle size as well as drug release of microsponge and effect of total polymer amount as well as HPMC:EC ratio on the targeted drug release of TBS. Microsponges containing TBS were prepared by oil in oil solvent diffusion method using eudragit RS 100. The effects of stirring time and speed on the physical characteristics of microsponges were investigated. SEM characterized the porous structure of microsponges and they were found spherical in shape. The lag phase in drug release was markedly dependent on the coat weight of HPMC and EC and HPMC: EC ratio in the outer shell. *In-vitro* studies exhibited that tablet formulations releases less than 20 % of drug in lower intestinal track. The DSC and FT- IR study showed that TBS did not interact with the formulation excipients. The release kinetics showed that the data followed Higuchi model and the mechanism of drug release was diffusion. CCT were evaluated for hardness, friability, weight variation and thickness. CCT of TBS microsponge shows no noticeable change in appearance and drug release after 1 month. Thus, CCT is promising approach for colon targeted delivery of TBS in relieving asthma attacks.

Biograpgy

Dr. Basu has completed his Ph.D at the age of 30 years from Bhagwant University and presently working as Assistant Professor at Atmiya Institute of Pharmacy, Rajkot from Gujarat Technological University. He has published more than 20 papers in reputed National & International journals.