"Formulation Development and Evaluation of Colon Targeted Drug Delivery System of Praziquantel for the Treatment of Schistosomiasis"

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ABSTRACT

The aim of this study was to develop and evaluate colon targeted drug delivery system of Praziquantel for the treatment of schistosomiasis. Natural polysaccharides as coating material were used for targeting the Praziquantel to the colon. Compression coating has been found to be useful for colonic drug delivery. Colon targeted tablet releases the drug at colonic pH; hence absorption and degradation of drug in stomach has been eliminated. Low solubility of Praziquantel had been enhanced by kneading method of complexation using β-cyclodextrin. Core tablet was prepared by direct compression method and coated with guar gum by compression coating to achieve colon targeted drug release. Effects of all the polymers, with different concentrations, on physical properties of colon targeted tablet were investigated. To evaluate the effect of Guar gum and HPMC K4M concentrations, 3^2 factorial design was employed and for β-cyclodextrin and Crospovidone, 2^2 factorial design was employed. The optimized core tablet with Drug: β-cyclodextrin ratio was 1:0.5; with 5% Crospovidone was disintegrated in less than 1 minute. Coated tablet of guar gum

with 42.5% and HPMC K4M with 30% has achieved lag time of 5 hours and up to 97.8% cumulative release in colon within 2.5 hours. The FTIR results reveal that drug and polymers were chemically compatible. From regression value it revealed that all formulations followed Hixon Crowell model, which indicates erosion release mechanism. The developed colon targeted tablet may be effectively used for oral administration in the treatment of schistosomiasis, thus more amount of drug goes to the systemic circulation thereby reducing dose.

Keywords: Praziquantel, β-cyclodextrin, colon target tablet, compression coating, guar gum, crospovidone.