

Guar gum and hydroxy propyl methylcellulose compressed coated tablets for colonic drug delivery: in vitro and in vivo evaluation in healthy human volunteers

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Abstract

ABSTRACT: The objectives of the present study are to evaluate guar gum in combination with hydroxy propyl methylcellulose (HPMC) as compression coat for colonic delivery of prednisolone as well as improving the mechanical properties of the compressed coated tablets. The core tablets containing 5 mg prednisolone were compression coated with 125 mg of coating materials consisted of guar gum alone or mixtures of guar gum in combination with different ratios of HPMC. The compressed coated tablets were evaluated for their mechanical properties, in vitro drug release and in vivo performance in human volunteers. The compressed coated tablets with coats containing HPMC exhibited acceptable mechanical properties. In vitro drug release studies in pH 7.4 phosphate-buffered saline medium containing 2% (w/v) rat caecal content have shown that increase in concentration of HPMC in the prepared coats from 10% to 20% resulted in an increase in the release rate. However, further increase in HPMC concentration to constitute 30% caused a reduction in the release rate. Based on the drug release results, tablets coated with coat consisted of 80% guar gum and 20% HPMC were selected for in vivo evaluation. In vivo gamma scintigraphic study on human volunteers using technetium-99m-diethylenetriamine pentaacetic acid as a tracer was performed. The results showed that tablets remained intact in stomach and small intestine, however partial and complete release of the tracer occurred in the colon. In conclusion, guar gum in combination with HPMC would be successfully used as a carrier for drug delivery to the colon.

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