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Site specific particulate carrier system of antitubercular drugs: A novel approach for intestinal tuberculosis

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Tuberculosis is a hazardous disease, which gradually swallow the life span of human beings. World wide it is estimated that one third of population is infected with Mycobacterium tuberculosis. The combination of drugs in formulation has been associated with problem of poor bioavailability of rifampicin from fixed dose combination (FDC) product containing isoniazid and / or pyrazinamide. Several studies indicated that rifampicin bioavailability rapidly lost in presence of isoniazid under acidic stomach condition. The aim of this work was to develop an oral particulate carrier system with improved bioavaibility of rifampicin in presence of isoniazid by minimizing the chemical interaction under acidic condition and improving the treatment of intestinal tuberculosis. Optimized microparticulate carriers of isoniazid and rifampicin were prepared. Isoniazid loaded microparticulate carrier was prepared by using alkaline extraction of ispaghula husk (AEISP 2-4 % w/v) and sodium alginate (2-4 % w/v) by emulsification-internal ionic gelation method utilizing barium carbonate as a cross-linking agent. Rifampicin loaded microparticulate carrier was prepared by using Eudragit RSPO (EuRSPO, 1-2%w/v) and ethylcellulose (1-2%w/v). In the present study SDS (0.05- 0.15 % (w/v)) was used as an additive during the preparation of rifampicin microparticles. The optimized drug-loaded microspheres of an average particle size of 51.53 µm and 40.46 µm and 83.43% and 86.65% entrapment efficiency was obtained for isoniazid and rifampicin respectively. The release of drug from microparticles was found to be diffusion controlled and concentration independent. The oral sustained release dosage form was prepared by incorporating an equivalent amount of isoniazid and rifampicin microparticles in a hard gelatine capsule shell. This drug delivery system was successful in preventing the drug interaction to a great extent due to reduced release of isoniazid in the gastric environment from microparticles.

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