**ABSTRACT**

Famotidine, an anti-ulcer agent was chosen as a drug which is a H2 receptor antagonist, 8 times more potent than ranitidine, 20 times more potent than cimetidine. Famotidine has an elimination half-life of 2.5-3.5 h and also only 15-30% of drug in plasma is protein bound. Therefore, the purpose of this research work was to formulate and evaluate famotidine oral in-situ gelling system for sustained oral drug delivery. Formulation chart was prepared by applying 32 full factorial design using two independent variables, i.e. concentration of gelrite and HPMC K100M.The prepared formulations were in liquid state and by addition of 0.1N HCl caused the solutions to transform into gel. The formulations prepared were evaluated for several physico-chemical parameters like drug-polymer interaction, pH, gelling capacity, drug content uniformity, in vitro drug release, viscosity and anti-ulceractivity (In-vivo study). The best formulation was selected and stability studies were carried out as per ICH Q1C guidelines. The stability studies showed that there was no significant change found inphysico-chemical properties and in vitro dissolution studies. The best-fit release kinetic was achieved with zero order. A 32 full factorial design was employed to study the effect of independent variables, i.e. concentration of gelrite (X1) and the concentration of HPMC K100M (X2) on dependent variables like % cumulative drug release(Q12), % drug content uniformity and viscosity. The results of the in-vivo study showed that sustained release of drug from the prepared formulation shows better % protective effect on alcohol induced stomach ulcer compared to that of marketed conventional tablet.

**Keywords:** Famotidine; Anti-ulcer agent; In situ gelling systems; Sustained oral drug

delivery; Gelrite; HPMC K100M; In-vivo study.