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Design and Development of Gastro Retentive Drug Delivery System of Tramadol Hydrochloride

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***SUMMARY*. The present investigation concerns the development of floating tablets of tramadol hydrochloride, which after oral administration are designed to prolong the gastric residence time; improves the drug bioavailability, reduces drug waste and diminish the side effects of drug. The D-optimal experimental design was employed to evaluate contribution of hydroxypropyl methyl cellulose (HPMC) K4M concentration, lactose concentration and kollidone SR concentration on drug release from floating tablets. Tablets were prepared using direct compression technique. Formulations were evaluated for *in vitro* buoyancy and drug release study using United States Pharmacopoeia (USP) 24 paddle type dissolution apparatus using 0.1 N HCl as dissolution medium. Multiple regression analysis was performed for factorial design batches to evaluate the response. All formulation had floating lag time below 2 min and constantly floated on dissolution medium for more than 24 h. It was found that optimized HPMC K4M (100 mg), kollidone SR (25 mg) and lactose (17.5 mg) have shown the release of 98.4 % in 22 h which was better as compare to marketed product (i.e. Tramazac-SR). Kinetic treatment to dissolution profiles revealed the diffusion mechanism so called as Fickian diffusion (Case I transport) which was mainly dependent on all the independent variables.**

KEY WORDS: D-optimal design, Floating tablet, HPMC K4M, Kollidone SR, Tramadol hydrochloride.

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