



Design, Development and *In Vitro* Evaluation of Swelling Gastro Retentive Drug Delivery System for Type 2 Diabetic Patients

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SUMMARY. The aim of the present study was to develop sustained release swelling tablets containing metformin HCl and confine them into the stomach for enhancement of bioavailability. The different batches were manufactured by wet granulation method with HPMC K200M and HPMC K100M in combination using Minipress and characterized by Fourier Transform Infra-Red spectroscopy, differential scanning calorimetry, x-ray diffraction, mucoadhesion, swelling, erosion and *in vitro* drug release. The optimized formulation F8 shows the 4 fold and F2 & F11 shows the 3 fold swelling. Mucoadhesion strength and *ex-vivo* retention time of F8 was found to have 128.47 grams and 9.23 h, respectively. The F2, F8 and F11 were proved to be an expandable GRDF and showed case II diffusion mechanism with optimum erosion. The *in vitro* drug release, mucoadhesion, swelling, erosion and *ex-vivo* retention time evidences were concluded that retention of tablets in stomach up to 14 h and sustained release of drug.

KEY WORDS: Gastric retention, Hydroxy propyl methyl cellulose K200M, Metformin HCl, Swelling matrix tablets, type 2 diabetes mellitus.

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