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Design and development of bilayer gastroretentive tablet containing metformin HCl and glipizide for the treatment of type II diabetes

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The aim of the present research work is to develop and optimize a bilayer antidiabetic floating matrix tablet containing Metformin HCI (MET) as sustain release in one layer, using different grades of hydroxy propyl methyl cellulose (HPMC) by direct compression method, and glipizide as immediate release from the remaining layer. Immediate action of glipizide will be helpful to control excess sugar, which will be maintained by metformin action later on. Thus, the developed single tablet will be sufficient instead of three to four tablets of both drugs per day, and it will also increase patient compliance and therapeutic efficacy. The formulations of immediate release layer were prepared by using various super disintegrants i.e. crossprovidone, sodium starch glycolate, and croscarmellose sodium by direct compression technique. 32 full factorial design was used to optimize sustain release formulations of Metformin HCl. The ratio of polymer blend (X1) and content of gas generating agents blend (X2) were chosen as independent variables. The tablets were evaluated for *in-vitro* dissolution profile, *in-vitro* buoyancy studies, comparison of dissolution profiles, kinetic modeling and drug release mechanism. Different super disintegrants were used to prepared immediate release tablets of GPZ. Among these SSG (5%) give good disintegration and the GPZ was completely released within 1 hr. Among the different grades of HPMC investigated, significant difference in the resulting MET release profiles from the SR layer of tablets was found. This indicated that the viscosity of the polymer affects the drug release rate when the drug is water-soluble and the dose is high. The results conclude that bilayer gastro retentive tablet of Metformin HCl and Glipizide shows desirable release profile, good floating, and sustained effect in stomach. There is a further scope to conduct the *in-vivo* studies by using various experimental animal models and correlate the *in-vitro- in-vivo* correlation.

Biography

Dr. Girish N Patel is a Ph.D., M. Pharm and he completed his Ph.D from Hemchandracharya North Gujarat University, patan, Gujarat, India. His area of interest mostly lies in the field of Polymer Technology.

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