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Preparation and evaluation of gastro-retentive floating tablets of bromhexine hydrochloride using thermoplastic granulation method

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Bromhexine hydrochloride thins and loosens mucus to help clear stubborn chest congestion and breathing difficulties due to excess mucus in cold, flu and respiratory tract infections. The need for its gastro-retention is that it is dissolved in the pH range of 1-4 and after that its dissolution almost ceases because of the low solubility in the lower region of the gastrointestinal tract. The oral bioavailability of Bromhexine HCl is 20%. Thus, the floating drug delivery system may help Bromhexine HCl to stay in the acidic pH for long time and improve its oral bioavailability. Floating tablets of Bromhexine HCl were prepared by using Thermoplastic Granulation technique. Different hydrophobic retardants were used namely carnauba wax, hydrogenated castor oil and a hydrophilic polymer HPMC E15V were used in different combinations at different ratios for the preparation of the tablets. They were evaluated for tablet thickness, hardness, weight variation, friability, floating lag time and *in vitro* drug release. Compatibility of the drug and polymers was assessed by Fourier transform infrared spectroscopy. Differential scanning calorimetry studies were also conducted. The λ_{max} of Bromhexine HCl was found to be 248 nm. FT-IR spectroscopy showed no interaction between the drug and polymers. DSC thermogram showed a sharp endothermic peak at 246 °C which is corresponding to melting point of the drug. The *in vitro* drug release study of the gastro-retentive floating tablets of Bromhexine HCl was found to be 89.3% at the end of 12 hours for formulation 10. All the 12 formulations remained buoyant and showed drug release up to 12 hours. The use of hydrophobic retardants and hydrophilic polymer in combination had its own advantages of maintaining integrity and buoyancy of tablets. It could be concluded that for the proper floating duration and *in vitro* release, the hydrophobic retardants and hydrophilic polymer must be used in proper ratio. Formulation 10 was considered as the optimized formulation.

Biography

Kelvin Bucktowar has obtained his BPharm and currently pursuing MPharm in Pharmaceutics at T John College of Pharmacy affiliated to Rajiv Gandhi University of Health Sciences, India. He has published numerous review and research articles in reputed journals.

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