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Design and Development of Buccal Delivery System for Atenolol Tablets by Using Different Bioadhesive Polymers

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Abstract : The mucoadhesive buccal tablet is an oral drug delivery system which attached to the buccal surface for direct drug absorption into the systemic circulation and the unidirectional drug release is ensured by formulating a hydrophobic backing layer. The objective of present study was to formulate mucoadhesive atenolol bilayer buccal tablets by using sodium alginate, hydroxyethyl cellulose, and xanthan gum as mucoadhesive polymer and the technique applied was direct compression method. Ethyl cellulose was used as backing layer of the tablet. FTIR and DSC analysis were carried out to identify the drug polymer interactions. The prepared tablets were evaluated for physicochemical parameters, ex vivo mucoadhesion time and in-vitro drug release. The formulated tablets showed the average surface pH 6-7 which is favourable for oral mucosa. The formulation containing sodium alginate showed more than 90 % of drug release at the end of the 7 hours in vitro dissolution studies. The formulation containing xanthan gum showed more than 8 hours of mucoadhesion time and all formulation exhibited non fickian release kinetics. The present study indicates enormous potential of erodible mucoadhesive buccal tablet containing atenolol for systemic delivery with an added advantage of circumventing the hepatic first pass metabolism.

Keywords : atenolol, mucoadhesion, in vitro drug release, direct compression, ethyl cellulose
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