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Formulation and investigation of chitosan ascorbate mucoadhesive buccal films

Hala Rayya, Katalin Kristó, Géza Regdon jr.

Institute of Pharmaceutical Technology and Regulatory Affairs, University of Szeged, Szeged, Hungary

Mucoadhesive buccal films have received increasing attention in recent years due to their several advantages. However, a major limitation associated with oral mucosal drug delivery is the low flux which leads to low bioavailability of certain drugs [1]. Chitosan is a good candidate as a film-forming polymer because it is safe, biocompatible, and biodegradable with adequate mucoadhesive properties [2]. Chitosan also has permeability-enhancing properties which could be improved by the salification with ascorbic acid [3], thus our current work aims to formulate chitosan ascorbate-based mucoadhesive films using solvent casting method. QbD approach is highly efficient in developing pharmaceutical products, therefore design of experiments was used. An initial screening design was applied and 6 factors at 2 levels were investigated. The levels of these factors were selected based on a literature review and some primary experiments. Breaking hardness, mucoadhesion, and elongation were selected as responses. In the next step, further optimization was done using 3 factors, 2 levels full factorial design, and based on the obtained results, a design space was established. Three formulas from this design space were investigated and they were accepted in terms of moisture content, film thickness, breaking hardness, mucoadhesion, and elongation. Based on this result, the obtained design space could be used to formulate the desired chitosan ascorbate mucoadhesive buccal films, that could be used for drug loading and further investigations.

References:

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