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Research Article

DEVELOPMENT AND *IN-VITRO* EVALUATION OF BUCCOADHESIVE FORMULATION OF DIMENHYDRINATE TABLET

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Abstract
Buccoadhesive tablets have long been employed to improve the bioavailability of drugs undergoing significant first pass hepatic metabolism. Dimenhydrinate is an anti-emetic drug. It was under goes extensive first pass metabolism resulting in an oral bioavailability of 46 % and it shows variable absorption from GIT. Buccal route offers several advantages such as rapid absorption, high plasma concentration level and ease of administration and termination of therapy. The present investigation concerns the development of Buccoadhesive tablets of Dimenhydrinate which were designed to prolong the buccal residence time after oral administration. Buccal tablets of Dimenhydrinate were formulated using four mucoadhesive polymers namely, Carbopol 934 P, HPMC K_4M, HPMC $K_{15}M$ and Sodium carboxymethylcellulose carried out studies for weight variation, thickness, hardness, content uniformity, swelling index, Bioadhesive force and in vitro drug release. Formulation of F5 were formulated by using polymers Carbopol 934 P and Sodium carboxymethylcellulose provided controlled release of Dimenhydrinate over period of 8 hrs. The cumulative % of drug release of formulation F5 were 96.67. In-vitro releases of F1 to F9 were found to be diffusion controlled and followed zero order kinetics. The stability studies showed that there was no significant change in adhesive strength, in-vitro release when stored at room temperature, 40°C, 2-8 °C for a period of 30 days. Formulation of F5 which were formulated by using polymers Carbopol 934 P and Sodium corboxymethylcellulose were established to be the optimum formulation with optimum bioadhesive force, swelling index & desired in-vitro drug release. Further investigations are needed to confirm the in-vivo efficiency, long term stability studies are needed to stabilize the controlled released (F5) formulations.

Keywords: - Buccoadhesive tablets, Dimenhydrinate ,Mucoadhesive polymers.

Introduction
The term 'buccoadhesive' describes materials that bind to the biological substrate, such as mucosal membranes. Adhesion of bioadhesive drug delivery devices to mucosal membrane lead to an increased drug concentration gradient at the absorption site and therefore improve bioavailability of systemically delivered drug[1]. Problem such as a high first pass metabolism and drug degradation in the harsh gastrointestinal environment can be circumvented by administering the drug via the buccal route. Moreover buccal drug delivery offers a safer method of drug utilization, since drug absorption can be promptly terminated in case of toxicity by removing the dosage form from the buccal cavity[2].Dimenhydrinate is a H_1 histamine antagonist. Antihistamines drug up the secretion of the nose, throat, and eyes. They relive itch and will help you go to sleep.

Dimenhydrinate prevents nausea, vomiting, or dizziness. However these drugs are not just antihistamine. They have a significant amount of anticholinergic activity[3].

Dimenhydrinate is unstable in gastrointestinal pH, after oral administration the absorbance of the drug is variable and undergoes extensive first pass metabolism, Bioavailability after oral administration is 46%. The onset of action is 60 min after administration and 10-20 min after I.V administration and half life is 1 to 5 hrs[4]. Hence it is suitable candidate for administration via the buccal route.

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