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Stability and permeability properties of sodium alginate buccal films

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In the pharmaceutical industry the classic drug discovery has lower priority, the companies try to find new and innovative drug administration routes to deliver the API. The buccal mucosa is considered an innovative route which has a lot of advantages. It can be achieved very fast effect locally and systemic equally. In our work we tried to target this administration route with formulating mucoadhesive polymer films. Our aims were investigating the stability and permeability of the formulated films.

The polymer films were prepared in room temperature by solvent casting method. To formulate the films sodium alginate (SA) and HPMC were used as film-forming agent and cetirizine dihydrochloride (CTZ) was added as API to the system. The stability of films was studied with accelerated stability test ($40\text{ °C} \pm 2\text{ °C}$, $75\% \text{ RH} \pm 5\% \text{ RH}$). During the stability test, thickness, tensile strength (hardness), in vitro mucoadhesivity of the prepared films were analyzed as physical properties. Furthermore, the interactions were investigated with FT-IR spectroscopy and the changes in the amount of API were also followed by dissolution study. Cell line permeability study was carried out on TR 146 buccal cells.

Cell line studies show that the permeability of films was enhanced by the presence of citric acid as it increased the total transported CTZ amount, but it was observed that it slightly reduced the stability of the films and all physical parameters that did not affect applicability. In our work we have successfully formulated CTZ-containing buccal films with adequate stability and appropriate absorption across buccal cell line.