
**Abstract:** The prolonged residence of drug formulation in the nasal cavity is of utmost importance for intranasal drug delivery. To improve the nasal retention time of Metoclopramide hydrochloride (MCP HCl), it has been formulated as in situ mucoadhesive gel by using blend of Poloxamer 407, Poloxamer 188 and carbopol 934P. The objective of this work was to improve the nasal bioavailability of antiemetic drug, MCP HCl by increasing its nasal retention time as well as by means of nasal permeation. Increase in the concentration of mucoadhesive agent enhanced the mucoadhesive force significantly. *In vitro* release of MCP HCl from the mucoadhesive system in simulated nasal fluid was influenced significantly by the properties and concentrations of carbopol 934P and showed enhanced bioavailability through its longer nasal residence time and ability to sustain the release of the drug. The *in vitro* tests performed for mucoadhesive strength and drug diffusion showed that nasal in situ gelling formulations prepared were having good mucoadhesive strength with nearly 100% drug diffusion. The formulations were evaluated for physiochemical parameter, gelation temperature, viscosity, gel strength, content uniformity mucoadhesive force, FTIR and DSC. So, this study points to the potential of mucoadhesive in situ nasal gel in terms of ease of administration, accuracy of dosing, prolonged nasal residence and improved nasal bioavailability.

**Key words:** Nasal drug delivery, Poloxamer 407, Poloxamer 188, Metoclopramide HCl.

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