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Formulation and evaluation of novel floating-bioadhesive gastroretentive *Caesalpinia pulcherrima* based beads of Amoxicillin for eradication of *Helicobacter pylori*

Nilima A Thombre and **Paraag S Gide**
M.E.T. Institute of Pharmacy, India

The rationale of the present study for establishing modified restricted discharge dosage forms is to escalate its therapeutic advantages with reduced unwanted impacts that improve management of diseased state. The objective was to potentiate natural polymer based novel drug delivery systems with formulation and evaluation of anti-*H. pylori* controlled release floating bioadhesive gastroretentive chitosan-covered amoxicillin trihydrate charged galactomannan of *Caesalpinia pulcherrima* (GCP)-Alginate beads (CCA-GCP-A) by ionotropic gelation method using 23 factorial design with concentration of quantity of drug, combination of GCP gum with sodium alginate and Calcium chloride as variables for treatment of *Helicobacter pylori* infection. Beads facilitated mucoadhesion to gastric mucosa with floating nature caused by chitosan coating for wide distribution throughout GIT. The developed beads were estimated for features as morphology, entrapment efficiency, DSC, XRD, FTIR, swelling ratio, *in vitro* mucoadhesion, *in vitro* drug release, *in vitro* floating and *in vitro H. pylori* development hindrance investigations. Chitosan covered amoxicillin charged GCP-A beads were studied in Wistar rats for *in vivo* gastric mucoadhesion, *in vivo H. pylori* growth inhibition studies using PCR amplification of isolated DNA, rapid urease test. The developed beads possessed drug release of 79-92%, entrapment efficiency of 65-89%, mucoadhesion of 61-89%. *In vivo* mucoadhesion study for of CCA-GCP-A beads showed more than 85% mucoadhesion of CCA-GCP-A beads even after 7th hour. *In vitro- in vivo H. pylori* development hindrance investigation offered complete *H. pylori* eradication. Current research interpreted that hiked duration of antibiotics residence in form of CCA-GCP-A beads acquired high antibiotics strength at lower pH in the abdomen which is must to ascertain bactericidal activity that populate under gastric mucus layer. GCP-alginate & chitosan in beads interacted with gastric mucosubstrate surface for prolonged gastric residence with floating and bioadhesion mechanism for *H. pylori* eradication in rats. Thus, floating-bioadhesive CCA-GCP-A beads offered assuring drug delivery system for eradication of *H. pylori* at lower dose, reduced adverse effect and enhanced bioavailability.

nilimathombre@gmail.com