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Design, development and *In-vitro* characterization of Amoxicillin trihydrate loaded mucoadhesive polymer grafted Ca^{+2} counter ion cross-linked interpenetrating polymeric network microbeads

Subhasis Kundu
Jadavpur University, India

The aim of the study was to improve the bioavailability of poorly water soluble drug Amoxicillin trihydrate and decrease the frequency of dosages through better encapsulation efficacy, improved gastric residence time and maintaining controlled release of drug from novel mucoadhesive interpenetrating polymeric network micro beads. Microbeads were using various mucoadhesive polymers such as sodium carboxy methyl cellulose (NaCMC), Guargum, Carbopol along with sodium alginate by single water-in-water (w/w) emulsion gelation process using calcium chloride as cross-linking agent in a complete aqueous environment. Chemical reaction between sodium alginate and calcium chloride to form calcium alginate was utilized for micro beads formation. Sodium alginate has been used as matrix material to achieve a control release drug delivery due to its hydrogel forming properties. *In vitro* swelling study of micro beads, entrapment efficacy and *In vitro* release study have been performed and release data were plotted in various kinetic model like Zero order, First order, Higuchi and Korsmeyer-Peppas model, Ex-*vivo* wash off test was also performed for understanding of mucoadhemisive property of prepared microbeads. Drug loaded microbeads were evaluated through Fourier transform infra-red (FTIR), X-ray diffraction (XRD) and SEM analyses after 3 months accelerated stability study. Scanning electron microscopy (SEM) micrograph of the beads suggested the formation of spherical particles. FTIR analysis indicated the stable nature of the drug in the blend microbeads. XRD analysis revealed amorphous state of drug after encapsulation.Formulations showed non-Fickian type transport mechanism. From the result of above mentioned study it can be concluded that Sodium carboxy methyl cellulose blended alginate microbead is better formulation for controlled release Amoxicillin trihydrate then others.

Biography

Subhasis Kundu has completed his B.Pharm and M.Pharm in Pharmaceutics from Jadavpur Universiy,Kolkata,India.He has received MHRD junior fellowship as GPAT qualified for pursuing M.Pharm from Govt.of.India. He has published various research articles in reputed international journals and book chapter in international publishing house as well as made some oral and poster presentation in National level conferences. Presently he is doing his Ph.D.research work at Jadavpur University in India.

subhasismorpheus@gmail.com