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Thiolated pectin containing hydrogels for controlled drug delivery of Cetirizine hydrochloride with its *in vitro* studies**Muhammad Hanif**

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Use of pectin in controlled release dosage form is reported in the previous literature and many dosage forms like tablets, microspheres and hydrogels were developed. Some studies reported the mucoadhesive properties of the pectin when used as drug carrier. In our study, we have developed thiolated pectin first by adding the thiol containing substances and then converted it into the hydrogel, having the capacity to use both lipophilic and hydrophilic drugs. Central composite rotatable design was successfully applied with the three variables and nine hydrogel formulations were planned in such a way that each three contains the difference in concentration of polymer, monomer and cross linking agent. Prepared formulations were further subjected to swelling, porosity, sol-gel fraction, cross-linked density and drug loading studies. Drug release studies were performed in USP 2 dissolution apparatus having the volume 900 ml at 37°C and with 100 rpm rotation. *In vitro* kinetic model dependent and model independent approaches were applied to select the one best hydrogel formulation. Morphological studies like SEM, FTIR, TGA, DSC and XRD were performed to check any interaction between the polymer and drug. Prepared hydrogels were dried at room temperature first and then in oven at 45°C. Maximum swelling observed was pH dependent and at 7.5 pH all formulations showed more than 100% swelling due to the presence of carboxylic acid group in the acrylic acid which has the pKa value four. Mucoadhesion in the thiolated pectin was increased as we increased the concentration of thiol glycolic acid. More than 85% release after 48 hours studies was found to be within limits. First order drug release was observed with the fickian diffusion because the n value was less than 0.45. Similar values proved that F5 formulation was the best due to its release pattern.

Biography

Muhammad Hanif has completed his PhD from University of Karachi, Pakistan. He is the Managing Editor of *Pakistan Journal of Pharmaceutical Research*, a biannually published journal. He has published more than 45 papers in reputed journals and has supervised 15 MPhil and six PhD students. His speciality areas are "Formulation development of controlled release dosage forms, micro-encapsulations, hydrogels, *in vitro* and *in vivo* correlations (IVIVC), pharmacokinetic and stability studies.

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