Preparation of chitosan nanoparticles as a drug delivery system for perindopril erbumine

ABSTRACT

Chitosan nanoparticles (CSNPs) and perindopril erbumine (PE)-loaded chitosan nanoparticles (PE-CSNPs) were prepared using the ionic gelation method with tripolyphosphate (TPP) as a crosslinking agent. The XRD pattern of the PE-CSNP nanocomposite shows suppression of the peaks corresponding to crystallized chitosan due to its conversion to the amorphous form after crosslinking and PE loading. The presence of the drug in the nanocomposite was confirmed by a shift in the FTIR transmittance peak from 1,289 to 1,279 cmī 1. The mean diameter of the PE-CSNP nanocomposite was 44 nm. Analysis of the ultraviolet spectrum indicated that the loading efficiency and the encapsulation efficiency were 30.5% and 94.1%, respectively. The in vitro drug release profile was also determined by ultraviolet spectroscopy, which showed a sustained release over a period of 2 h (99.8%), starting with initial burst release (40% in 10 min). According to our results, no IC50 (the half maximal inhibitory concentration) against the 3T3 cell line was found for free PF or the PE-CSNP nanocomposite up to 100 ε g mLī 1.