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Development of Biodegradable Microspheres Containing Ciprofloxacin Hydrochloride: In Vitro Release Study

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Purpose: The purpose this study was to develop a biodegradable microspheres system to prolong the ciprofloxacin (CPH) release optimizing its clinical application.

Methods: *Microspheres preparation*. Adequate amounts of CPH were dissolved in ethanol water (1:1v/v) and then was added in acetone solution containing amounts of polylacitic-co-glycolic acid (PLGA) in order to obtain 1:1, 1:2, 1:3, and 1:5 w/w CPH:PLGA proportions. *Drug loading*.Few milligrams of microspheres were dissolved in 10mL of glacial acetic acid and aliquot this solution was transferred to 10mL of acetic acid 0,1M. The concentration of drug was determined using the equation supplied by pattern curve (r2=0,9968) obtained using the same procedure efficiency. *In vitro release study***.** Amounts of CPH loaded microspheres equivalent to 1,0mg of CPH were suspend in 3mL of Tris buffer in tubes, which were placed in shaker bath (dissolution test HANSON SR8PLUS) maintained at 37ºC ± 0,2ºC in quadruplicate. As control, the pure CPH was used. The concentration of drug was determined using the equation supplied by pattern curve (r2=0,9999) obtained. **Results:** The encapsulation efficiency ranged between 90,56 % and 126,55 % and the CPH content in the microspheres determined was of 49,93 ± 0,20%; 30,18 ± 1,54 %; 24,51 ± 0,52 and 21,09 ± 0,68 % to CPH loaded PLGA microspheres 1:1; 1:2; 1:3 and 1:5 w/w respectively. The time necessary to release all CPH content in pure CPH and CPH loaded PLGA microspheres 1:1 and 1:2 w/w was of 15 minutes, while in the CPH loaded PLGA microspheres 1:3 and 1:5 w/w was of 60 minutes. **Conclusions:** The prolonged effect observed only CPH loaded microespheres 1:3 and 1:5 w/w, occurred mainly due the high hydrophility of CPH and high hidrofobicity of PLGA, and due the high concentration of drug present in the PLGA microspheres tested. The next step of this study includes the use of lower concentration of CPH and substitute the CPH by ciprofloxacin that is a less soluble form of the drug.