ABSTRACT

EFFECT OF DRUG AND POLYMER RATIO ON RELEASE OF CIRPROFLOXACIN HCl-ALGINATE/ CARRAGEENAN MICROSPHERES

(Prepared by ionotropic gelation method using aerosolization technique)

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Ciprofloxacin is an antibiotic used for treating cystic fibrosis. In this research, ciprofloxacin HCl was used as a model drug. The aim of this research is to investigate the effect of drug and polymer ratio on the release of microspheres. Ciprofloxacin HCl-alginate/carrageenan microspheres were made with ionotropic gelation method using aerosolization technique. The raw material must be evaluated in qualitatively like appearance, DTA, and IR before it was used for making microsphere. In this research, there are three formulas consist of different rati of drug and polymer: 1:0,83 (F1) ; 1:1,25 (F2); and 1:1,67 (F3) these formulas used $CaCl_2$ (0.3M) as crosslinker. After microspheres formed, it will resuspended into the solution of lyoprotectant maltodextrin (5%) and was dried using freeze dryer. The result of ciprofloxacin HCl microsphere evaluation includes characterization drug loading, entrapment efficiency, and yield. Results showed that particle size was within range 1,24 µm to 1,72 µm. Results showed that drug loading was within range 21,29 % to 38,18 %. The result of entrapment efficiency was within range 52,86 % to 76,2 %. The result of yield between F1 until F3 were (70,72 ± 1,77), (55,10 ± 1,18), and (49,83 ± 3,87) %. F1 was a formula with the smallest polymer concentration (highest raio drug and polymer) and the F3 was the conversely. The percentage of ciprofloxacin HCl released from microspheres was within the range (47,66 ± 12,23) to (72,64 ± 13,33) %. The release occur in 10 minutes for all the formulas that had been make. This research showed that higher polymer concentration produced slower release rate. Statistically analysis showed that cumulative release of ciprofloxacin from microsphere didn't affected by the ratio of drug and polymer.

Keywords : Ciprofloxacin HCl-Alginate/Carrageenan, Drug and Polymer Ratio, Ionotripic Gelation, Aerozolization Technique, Release Rate.