ABSTRACT

EFFECT OF $CaCl_2$ CONCENTRATION ON THE CHARACTERISTICS OF ERYTHROPOIETIN-ALGINATE MICROSPHERES

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The aim of this research was to investigate the effect of $CaCl_2$ concentration on the characteristics (particle size, morphology, swelling index, and yield) of erythropoietin-alginate microspheres prepared by ionotropic gelation method with aerosolization technique using sodium alginate as polymer and $CaCl_2$ as crosslinker. Erythropoietin-alginate microspheres formed were dried using freeze drying method with maltodextrin as lyoprotectant. The concentrations of alginate used were 2%, and $CaCl_2$ concentrations were 0.5 M, 0.75 M and 1 M.

Results showed smooth and spherical microspheres for all formula with average particle size were 3.23±0.05 μm (F1); 2.99±0.07 μm (F2); and 2.86±0.03 μm (F3). Mass swelling index at 24 hours were 1.25±0.10 (F1), 1.18±0.11 (F2), and 1.11±0.10 (F3); at 30 hours were 2.00±1.25 (F1), 1.85±0.14 (F2), and 1.72±0.15 (F3) while particle size swelling index at 24 hours were 1.15±0.10 (F1), 1.11±0.10 (F2), and 0.97±0.10 (F3); at 30 hours were 1.81±0.09 (F1), 1.73±0.15 (F2), and 1.54±0.14 (F3). Respectively yield percentage were 77.76±6.49 % (F1), 80.01±3.53 % (F2), and 82.97±4.22 % (F3).

By using One Way ANOVA, it was found that there were significantly differences between three formulas. The particle size of formulas decreased by increasing concentration of $CaCl_2$, whereas no significant difference on swelling index and yield from microspheres with increasing $CaCl_2$ concentration simultaneously.

Keywords: Ca-alginate microphores, erythropoietin, ionotropic gelation, characterization.