

ABSTRACT

EFFECT OF LYOPROTECTANT CONCENTRATION ON THE CHARACTERISTICS AND PENETRATION OF GLUTATHIONE WITH OPTIMAL LIPOPHILICITY IN ALGINATE MICROSPHERES

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The aim of this study was to determine the effect of lyoprotectant concentration on the characteristics of glutathione alginate microspheres. Microspheres were prepared using Na-alginate as polymer and CaCl₂ as crosslinking agent using ionotopic gelation and aerosolisation technique. Maltodextrin as lyoprotectant was added to protect the physical integrity of the microsphere during the freeze drying process.

The evaluations included FT-IR, SEM, particle size distribution using optical microscopy, drug loading, entrapment efficiency and yield. The resulting microspheres formed were spherical and smooth. The particle sizes of formula F1, F2, F3 and F4 were 3.59 μm ; 3.09 μm ; 2.78 μm ; and 2.09 μm , respectively. The drug loading results of formula F1, F2, F3 and F4 were 25.49 ± 0.29 ; 26.93 ± 0.14 ; 28.14 ± 0.31 ; and 29.53 ± 0.22 , respectively. The entrapment efficiency results of formula F1, F2, F3 and F4 were 43.83 ± 0.29 ; 50.45 ± 0.27 ; 58.95 ± 0.51 ; and 66.68 ± 0.45 , respectively. The yield of formula F1, F2, F3 and F4 were $64,22 \pm 0,42$; 70.50 ± 1.82 ; 78.04 ± 2.02 ; and 86.84 ± 2.35 respectively. The statistical analysis of entrapment efficiency, glutathione content and yield showed that the increase of lyoprotectant concentration resulted in significant difference in all those characteristics.

The penetration assay in second hour showed could deeper penetration of glutathione gel compared to glutathione-alginate microspheres gel. Yet in fifth hour the glutathione-alginate microspheres penetrated deeper and had a clearer laminar luminance intensity than glutathione gel.

Keywords : microspheres glutation-alginate, lyoprotectant concentration, characteristic microspheres, penetration in vivo