药学学报 2007, 42(6) 681-686 DOI: ISSN: CN:

论文

鲑鱼降钙素柔性脂质体大鼠鼻腔给药的降血钙效应

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摘要：

本文采用薄膜分散-超声挤压过膜法制备鲑鱼降钙素柔性脂质体，对其形态学及粒径进行了考察。以大鼠为实验动物，鼻腔给药，采用OCPC比色法测定大鼠血清钙离子浓度，计算降血钙百分率*F*%和降血钙效应*D*%，与鲑鱼降钙素普通脂质体、鲑鱼降钙素水溶液比较，以此评价鲑鱼降钙素柔性脂质体经大鼠鼻腔给药后的降血钙效应和附加剂对降钙素柔性脂质体的降血钙效应的影响。另外还对柔性脂质体的纤毛毒性进行考察。结果表明鲑鱼降钙素水溶液仅轻微降低血钙浓度，鲑鱼降钙素普通脂质体能提高降血钙效果，鲑鱼降钙素柔性脂质体呈现了最强的降血钙效果，其降血钙效果与脂质体中附加的表面活性剂的用量和种类相关，用去氧胆酸钠修饰的脂质体的降血钙效果最好，并且附加的表面活性剂用量越高，降血钙效果越强。柔性脂质体可以显著地降低去氧胆酸钠的纤毛毒性。结果显示，柔性纳米脂质体能显著提高降钙素经鼻腔给药的降血钙效果，柔性脂质体是蛋白多肽类药物鼻腔给药的一种有效的载体。

关键词： 柔性脂质体 鲑鱼降钙素 鼻腔给药 降血钙作用

The hypocalcemia effect of salmon calcitonin ultra-flexible liposomes after intranasal administration in rats

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Abstract:

This article describes the preparation of salmon calcitonin ultra-flexible liposomes and their hypocalcemia effect after intranasal administration in rats. Both the conventional liposomes and ultra-flexible liposomes were prepared by rotary evaporation-sonication and extrusion. The morphology of ultra-flexible liposomes was observed with transmission electronic microscope. The size and size distribution and their zeta potential were determined by dynamic light scattering. The mean size of ultra-flexible liposomes with DC-Chol was no more than 120 nm, while the mean size of the conventional liposomes was 256.5 nm. The results showed the content of sodium deoxycholate have significant effect on the mean particle size of liposomes. The ultra-flexible liposomes were intranasal administrated at the dose of 5.0 μg·kg^{-1}; the concentration of serum calcium was determined by OCPC method. The results showed that the salmon calcitonin solution only slightly lowered serum calcium levels and the conventional liposomes could improve the effect of decreased serum calcium level (*D*%), and the ultra-flexible liposomes had the best effect on the decreased serum calcium level, and the hypocalcemia effect was correlated with the content of sodium deoxycholate which was present in the liposomes. Moreover the ciliotoxicity of ultra-flexible nanoliposomes on nasal mucocilia was investigated with the electron microscope scanning. The results showed that the ultra-flexible liposomes markedly reduced the ciliotoxicity of sodium deoxycholate on nasal mucous. Thereby the ultra-flexible liposomes significantly enhanced the hypocalcemia effect of serum calcium after intranasal administration in rats. The ultra-flexible liposomes could be an effective carrier for intranasal delivery of the peptide and protein drugs.

Keywords: salmon calcitonin intranasal administration decreased serum calcium level effect ultra-flexible liposome

收稿日期 2006-12-01 修回日期 网络版发布日期

DOI:

基金项目:

通讯作者: 刘艳

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