

Transdermal iontophoretic delivery of enoxacin from various liposome-encapsulated formulations

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摘要

Abstract

The major purpose of this work was to study the effect of various liposome formulations on the iontophoretic transport of enoxacin through excised rat skin. The electrochemical stability of these liposomes was also evaluated. The encapsulation percentage of enoxacin was significantly enhanced after 6 h incubation in an electric field; whereas the fusion of liposomes was inhibited by application of electric current. The results of iontophoretic drug transport showed that the permeability of enoxacin released from liposomes was higher compared with that of free drug. The iontophoretic permeability of enoxacin released from liposomes increased with a decrease in the fatty acid chain length of the phospholipid, which may be due to the different phase transition temperatures of the phospholipids. Incorporation of charged phospholipid resulted in an alteration of the transdermal behavior of enoxacin: the iontophoretic permeation as well as the amount of enoxacin partitioned in skin was greatly reduced after incorporation of stearylamine in liposomes, which can be attributed to the competitive ion effect. The enoxacin released from stratum corneum-based liposomes showed the highest amount of enoxacin partitioned into skin depot. The results of employing cathodal iontophoresis on negative charged liposomes suggested that the liposomal vesicles or phospholipids may carry enoxacin into deeper skin strata via the follicular route.