The Percutaneous Penetration of prostaglandin E and Its Alkyl Esters

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摘要

Abstract

The percutaneous delivery of PGE1 and its alkyl esters in alcoholic saline solution through hairless mouse skin was compared. The quantification of alkyl esters was based on the same principle as that for PGE1, which was converted to PGB1 to enhance the sensitivity and minimize the interference. Results showed that it was PGE1 that appeared in the receiver compartment for all alkyl esters examined. The flux of all alkyl esters of PGE, in the same concentration was higher than PGE, itself at most of saline vehicle with various fractions of alcohol. The maximal flux for a fixed concentration of each alkyl ester appeared at different fractions of alcohol. When the fractions of alcohol was kept constant, the alkyl ester that showed the maximal flux at this concentration appeared to have a longer chain length with increasing the fraction of alcohol. But isopropyl ester deviated from this order. It was concluded that the alkyl ester derivatives promoted the penetration of PGE1 mainly as a result of enhancing the drug partitioning into the stratum comeum. The alcohol fraction that needed to achieve the maximal flux at the same concentration increased with the increase of alkyl chain length, which resulted in the decrease of solubility parameter. It is necessary to optimize the fraction of alcohol in the saline solution in order to achieve the maximal flux at a fixed concentration for these alkyl esters with different alkyl chain length.